THE physical therapy REVIEW

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Exercise in a Weightless Environment — POTTS and BOWRING

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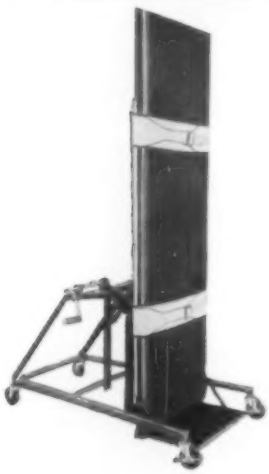

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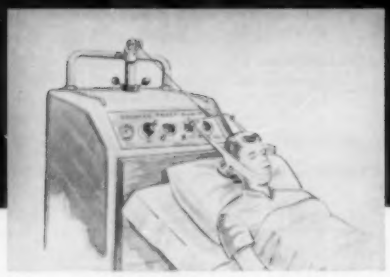

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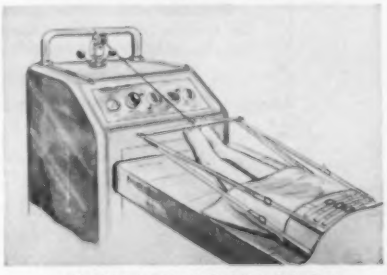

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Vol. 40 No. 8

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The *Physical Therapy Review* is published monthly by the American Physical Therapy Association, 1790 Broadway, New York 19, N.Y. Reentered as second class matter August 11, 1949 at the post office at New York. N. Y., under the act of Congress of Aug. 24, 1912.

Subscription rates: $7.00 per year to nonmembers: $8.00 in Canada and foreign countries.

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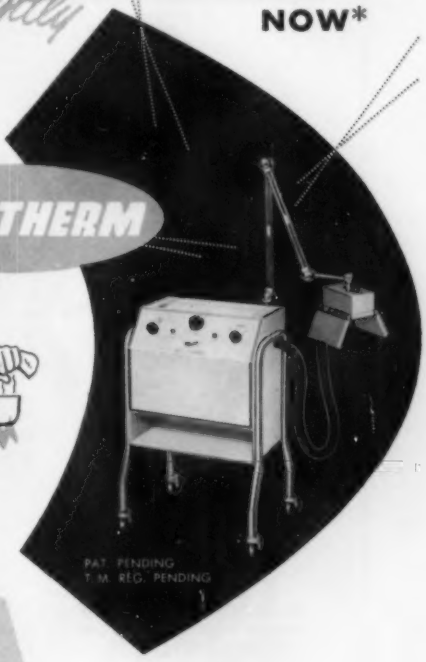

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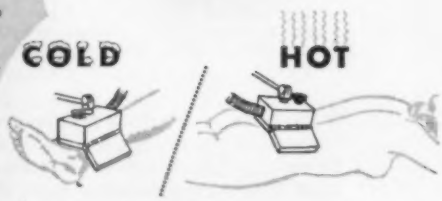

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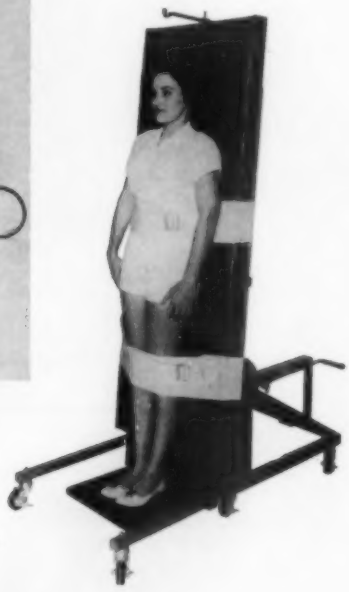

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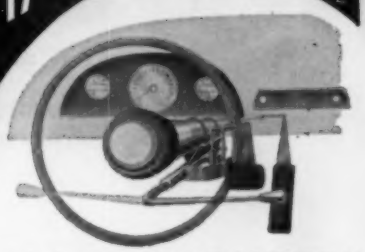

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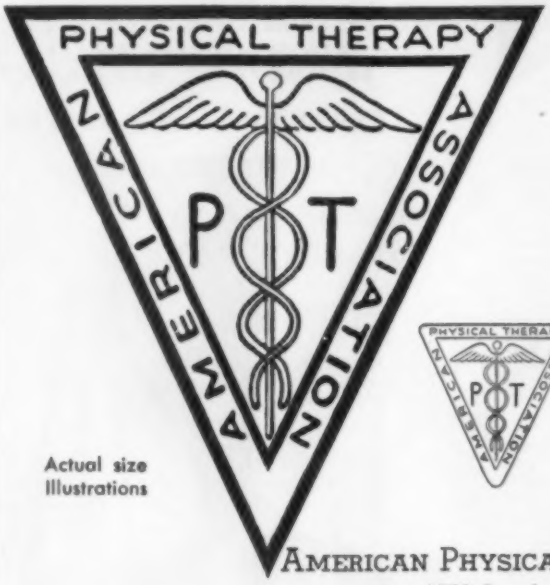

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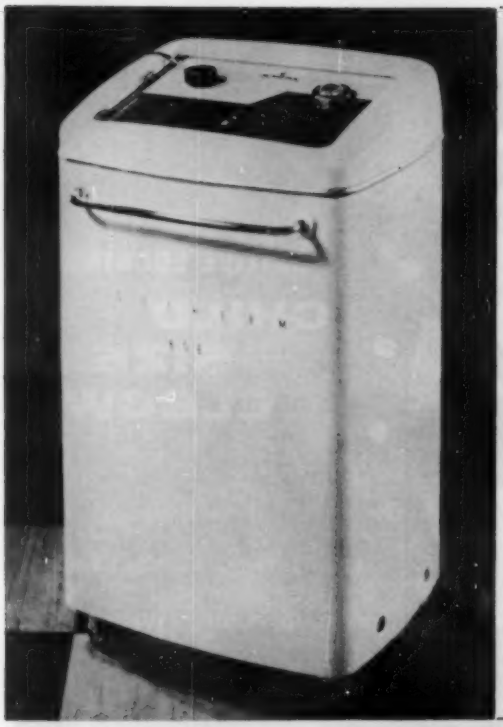

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The Physical Therapy Review

Official Publication of The American Physical Therapy Association

*The Development of Physical Therapy as a Profession Through Research and Publication**

Catherine Worthingham, Ph.D.†

To be specific and very blunt—if your objective is to develop physical therapy into a profession—you must give attention to the differences between technicians and professional persons. Historically you are technicians. You aspire to professional status. You are sensitive to the lack of confidence of the medical profession in your professional competence and judgment and, as a result, are often defensive in your reactions. Many of you fail to realize that to call yourselves professional does not of itself entitle you to such a designation. To be professional, members of a group must possess a body of knowledge that is both identifiable and different from that of other professions. They must also assume responsibility for adding to that body of knowledge and for developing their own standards of education and practice.

If we agree that a craftsman becomes a professional when he possesses an identifiable body of knowledge built on basic principles and not just a set of technics, we must also agree that the rate of growth of the profession will be in proportion to the rate at which that body of knowledge and basic principles grows.

How, then, is any body of knowledge and set of basic principles developed? In one form or another (depending on the kind of material one deals with), the answer is: through research.

Since research has become a word with certain magical connotations, with specialized meanings for all the branches of endeavor which now covet the research approach, it is only fitting that we decide what we mean by research and what physical therapy research means in the setting of medical research.

For now I would like to use a professional amateur's description of research. Charles Franklin Kettering once said:

"Research is a high-hat word that scares a lot of people. It needn't. It is nothing but a state of mind—a friendly, welcoming attitude toward change. It is the problem-solving mind as contrasted with the let-well-enough-alone-mind. It is the composer mind instead of a fiddler mind. It is the tomorrow mind instead of the yesterday mind."

The important fact which I think Kettering recognized is that the word research has a flavor of dissatisfaction with the search made to date or with previously accepted explanations. It more than suggests a desire to go beyond the present. It wants to re-examine the evidence upon which present facts were built, and this, in turn, often leads to refining the methods by which the evidence was secured. Thus research involves a critical examination of our sources and ways of learning what we now describe as "facts."

Clarifying what research is NOT, however, may be more fruitful for the moment than trying to say exactly what IS. Research is not mere recording of observation and reading the dials of complicated instruments. Research is not becoming acquainted with all the doctrines, postulates and concepts in a particular field, though this may well precede research.

Research is not summarizing or compiling facts. A compiler can be unacquainted with his material.

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* Address presented to New York Chapter, APTA, May 23, 1959, and to Massachusetts Chapter, APTA, Dec. 1, 1959.

† Director, Department of Professional Education, The National Foundation, New York.

Research is not painstaking study; study alone is passive. Analysis is but an element of the research method. As someone has said, "A man with no theory to test, watching a rat in a maze, is too much like the rat he watches. Perhaps this analogy is unfair to the rat who, after all, may be testing a series of hypotheses with a single purpose."

Research is not invention. Invention may call for research, or research may lead to invention, but one is not the other. Research requires curiosity, not just response to a need.

These activities which are so often mistaken for research bear an interesting relationship to it. Research as a procedure consists of a sequence of activities each of which contributes to, but cannot be substituted for, the whole process. These are selecting, observing, recording, comparing, analyzing, classifying the phenomena, and finally deriving appropriate inferences.

Rarely does research proceed in so orderly and methodical a fashion. It is most likely to be a mixture of irregularities, intuitive guesses and omissions which may designate what to leave out as well as what to leave in.

DEVELOPMENT OF RESEARCH

Now let us turn from describing research to examine its setting in the field of physical therapy. Research is part of physical therapy in the sense that it is a growing fringe of this field. Physical therapy has generally been thought of as a therapeutic technic, not a source of new knowledge.

The appreciation of physical therapy, as a source of new knowledge, depends not only upon the changing climate in the world of patient care, but also upon the shifting intellectual horizons of physical therapists.

This is not to imply that physical therapists are slow to see. Medical research as a deliberate, well-supported activity of man is new. As Alan Gregg pointed out, there is no reference to research in the Hippocratic Oath. This, he says, "is a fact almost picturesque, and certainly arresting in its implications, for it means that for two thousand years physicians were not reminded that it was their duty to go much beyond finding a remedy for a complaint."

In contrast to medicine, physical therapy as an organized profession has come into being during the years that have witnessed the casting of light upon nearly every recognized disease as a result of deliberate research endeavor. The happy result is that in its relative youth, the physical therapy profession can be attentive to the results research has brought to professions much older than itself.

There is not the least doubt that the attitude toward and interest in research among physical therapists is changing rapidly. Most of you realize that the old "how-to" orientation must shift to "why?" In turn, fewer and fewer physical therapists are content with the phrase: "I can show you how but I cannot tell you why to do these things." Not only is physical therapy research now accorded a recognized place by the practicing profession but the possession of facilities for research has become a matter of pride to a number of physical therapy schools and clinical facilities in this country.

This changing attitude, however, puts a heavy burden of responsibility on the profession. The opportunities for participation in research (and the acceptance and prestige that go with it) are now being accorded physical therapists in a number of our medical schools and other research programs. The development of more opportunities will depend in large measure upon the quality of research that is done by physical therapists in these institutions during the next few years.

What, then, are the essential requirements of good research? Through what screen of examination should a proposed research undertaking pass to deserve serious consideration?

In the last analysis, advancement of knowledge depends upon human beings, their intelligence, their training, and the conditions under which they work. If participation in research is a requisite for a profession, then intelligence must be a requisite for entering the profession.

It should be the privilege of a professional student—in fact a requirement—that he do at least one piece of research, by himself, no matter how simple a problem it may be. This will take time, reading, and a lot of thinking. It will teach him, as nothing else can, the need for an inquiring, observing approach to the things he otherwise accepts as assured. It will also give him an appreciation of research as the means by which the basic principles and knowledge of a profession are obtained.

Hopefully, such a research experience will provide a stimulus to the student who has the capacity to contribute to his profession, to pursue graduate study in an appropriate field, and to seek employment in an environment where he will have an opportunity to develop his capacity as a member of a professional team concerned with the advancement of the science and art of patient care.

These, then, are some of the realities required for physical therapy research—that it calls for

people possessing that rare quality, a discovering mind; that it depends upon a promising lead as well as a trained intelligence; that the talent for giving new ideas their proper prospective and appropriate experimental tests is rare; and that the rewards are not always early in coming.

If research is to remove physical therapy procedure from the realm of empiricism, it can only be accomplished through the presentation of resulting facts and principles in the literature of the physical therapy and related professions.

Herein lies a weakness of those of us who earnestly desire to see physical therapy become a recognized profession.

As an indication of this weakness let me cite for you a few findings of a study made in 1956 of 1,800 National Foundation physical therapy scholarship and fellowship recipients.

This study revealed that 14 per cent (252) had undertaken graduate study of some type, one per cent (or 23) of these individuals beyond the Master's degree, but that only 6 per cent (108) had contributed in any way to the literature of the profession.

I doubt that the situation in physical therapy has changed significantly since 1956. We cannot escape the fact that a group must develop its own literature and that this literature must reflect steadily increasing standards of excellence.

It should give us pause for thought that we have a very small percentage of our total physical therapy population who are prepared for positions on the academic faculties of our colleges and universities, where they must assume responsibilities that include teaching and research.

In essence, the task of those who would further research in physical therapy is to find, train, and support the best quality of investigators. The training of the investigator-type physical therapist is a new challenge.

More than ever before, the physical therapist needs association with and assistance from a wide range of sciences. Physical therapy research obviously bears close relationship to research of many other kinds. As the practice of physical therapy today may become the clinical knowledge of tomorrow, so the discoveries of physics, chemistry, and social science of today will be integrated into the physical therapy of tomorrow.

What I have said to date may be discouraging. It needn't be. All of the problems facing the profession in attaining its objectives do not have to be solved simultaneously. In fact, no profession has ever done so.

First, you can comfort yourselves with the knowledge that there are very few original scientific discoveries in a century. It is not likely that one of you will make one of them.

Nevertheless, we can point out that a published article is valuable to the profession, as Henry Davidson says: "(1) if old material is refiltered through the author's own experience; (2) if existing literature is critically reviewed; (3) if minor tips can be given to fellow workers; (4) if illustrative cases can be cited; or, (5) if a new twist can be given to an old idea." One could cite many other examples.

Such an approach is not research in the sense of "a diligent and systematic inquiry or investigation into a subject to discover facts or principles." It is search and it does give experience in handling material of various types in written form. In the process of search one may well find an area of interest that will lead into research.

WRITING FOR PUBLICATION

While we are considering the importance of obtaining practice in handling materials and in writing for publication, may I pursue the subject in a lighter vein. One of the more entertaining and truly useful dissertations on this subject is a short article that appeared in *The Scientific Monthly* some years ago, entitled: "The Principles of Poor Writing," by Paul W. Merrill of the Mt. Wilson Observatory in Pasadena. I shall quote from it at some length:

"The average student finds it surprisingly easy to acquire the usual tricks of poor writing. To do a consistently poor job, however, one must grasp a few essential principles."

First, "ignore the reader wherever possible"

"If the proposed title, for example, means something to you, stop right there; think no further. If the title baffles or misleads the reader, you have won the first round. Use long sentences containing many ideas loosely strung together. *And* is the connective most frequently employed in poor writing because it does not indicate cause and effect, nor does it distinguish major ideas from subordinate ones. *Because* seldom appears in poor writing, nor does the semicolon—both are replaced by *and*.

"Camouflage transitions in thought. Avoid such connectives as *moreover, nevertheless, on the other hand*. If unable to resist the temptation to give some signal for a change in thought, use *however*. A poor sentence may well begin with *however* because to the reader, with no idea of what comes next, *however* is too vague to be useful. A good sentence begins with the subject or with a phrase that needs emphasis.

". . . If you wish to play a little game with

the reader, offer him the wrong antecedent as bait; you may be astonished how easy it is to catch the poor fish . . .

"In every technical paper omit a few items that most readers need to know. You had to discover these things the hard way; why make it easy for the reader? . . ."

Second, "be verbose, vague, and pompous"

"The cardinal sin of poor writing is to be concise and simple. Avoid being specific; it ties you down . . . include many superfluous words and phrases. Poor writing, like good football, is strong on razzle-dazzle, weak on information."

For an example of deadwood compare the next two sentences.

"*Concise:* The dates of several observations are in doubt.

"*Poor:* It should be mentioned that in the case of several observations there is room for considerable doubt concerning the correctness of the dates on which they were made."

Razzle-dazzle isn't much trouble. "Well for us that the pulsing energy of the great life-giving dynamo in the sky never ceases. Well, too, that we are at a safe distance from the flame-licked whirlpools into which our earth might drop like a pellet of waste fluff shaken into the live coals of a grate fire."

Third, "do not revise"

"Write hurriedly, preferably when tired. Have no plan; write down items as they occur to you. The article will thus be spontaneous and poor. Hand in your manuscript the moment it is finished. Rereading a few days later might lead to revision—which seldom, if ever, makes the writing worse . . . resist firmly any editorial suggestions. The critic may be trying to help you or he may have an ulterior motive, but the chance of his causing improvement in your writing is so great that you must be on guard."

To return to a more serious vein, when you have found what you think is a suitable research problem, test it by a number of criteria.

Dr. Trelease in his excellent little book on *The Scientific Paper* suggests among other criteria the following:

1. The problem should deal, usually in a quantitative way, with the relations between natural phenomena—or, more specifically, with the causal conditions that control observable facts or events.
2. It should be circumscribed, definite, and specific, but should preferably lead far into the literature.
3. It should be capable of statement in the form of several hypotheses, each of which may be tested in order.
4. It should be capable of experimental treatment with the knowledge and facilities available, and it should give promise of yielding definite results within the allotted time.
5. It should have as its primary object the obtaining of new information in a specific field, preferably one possessing importance to the science as a whole.
6. It should give promise of leading to other interesting and important problems, and prepare the investigator for handling them.
7. It may test some proposition about which there is difference of opinion, or one that has secured acceptance upon logically insufficient grounds.
8. It should preferably deal with some relatively little-known principle, rather than with one that is better known and more thoroughly analyzed.
9. It may well treat some phase of the subject that has been relatively neglected.
10. It should deal with materials well-adapted to the proposed experimentation . . .

SUMMARY

Only the person who has actively participated in research is completely aware of the effort and toil necessary to establish even a very little new fact or causal relationship. I have no intention of trying to submit you to that trauma here.

Instead, having offered a brief discussion on research and publication, together with some of the implications for the development of the physical therapy profession, I should like to comment upon the significance for all of medicine which I believe may result from research in the field of physical therapy.

It has been said repeatedly that: the perpetual enemies of the human race are ignorance and disease; medical research exists for the purpose of fighting disease and ignorance; and every newly discovered fact changes the world, permanently.

Medical research is moving now toward the study of health and the components of individual performance and happiness. This is a new and fascinating change in medicine. It concerns not merely muscles, joints, and separate organs, but the functions of the mind, emotions, and the body.

It's a wide-wide world as John W. Garner, president of the Carnegie Corporation, has so eloquently said:

"Sensible people will bear in mind that in the long run our hope must be an intensified effort to create in this country a vigorous, excellent, well-rounded educational system at all levels, a

strong and well-supported effort in all fields of fundamental research, and a deep-rooted respect for the life of the mind. To a society functioning in our tradition, these are the basic ingredients not only of scientific excellence, but of all advancement of knowledge."

May I emphasize these are also the basic ingredients for the development of a profession.

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J

Strengthening the Quadriceps Femoris

Progressive Weighted Isometric Exercise Method

Mary S. Lawrence, Major, AMSC, and Judith A. McGrail, 1st Lt., AMSC

The progressive weighted isometric exercise to be described was devised to meet the requirement of developing functional strength of the quadriceps femoris muscle while admitting the least possible stress to the articular surfaces of the knee joint. Such an exercise requirement appeared to be indicated in the postsurgical treatment of a patient with severe osteochondritis accompanied by chronic synovitis.

CASE REPORT

On November 7, 1958, Corporal R. M., a 27-year-old male, was admitted to Valley Forge Army Hospital (VFAH) as a transfer patient, with a diagnosis of osteochondritis of both knee joints.

The patient's history revealed that he had observed swelling in the right knee in 1950 while working on a farm. This swelling had persisted for about eight months and then subsided. At the time of his induction into service on January 23, 1957, both knees were asymptomatic. His records, however, did note a second degree pes planus present bilaterally.

In April, 1957, while undergoing basic training, the patient developed swelling in the left knee joint which diminished after three weeks of conservative treatment. The left knee remained free from effusion until August of that year when the patient twisted the limb while going downstairs. He again received conservative treatment.

From the Physical Therapy Department, Valley Forge General Hospital, Phoenixville, Pa.

He complained of an aching sensation in the left knee joint which was aggravated by prolonged standing and walking. X-rays revealed several calcific shadows in both knee joints. He was then transferred from Muenchweiler to the USAH, Landstuhl, Germany. Later he was transferred to VFAH for further treatment and disposition. X-rays, taken shortly after his arrival at VFAH, revealed large, partly calcified bodies in the left knee joint. One of these bodies was noted in the region of the weight-bearing surfaces (Fig. 1).

An operation was performed on the left knee, November 18, 1958. When the capsule was opened, approximately 10 cc. of hazy yellow fluid was discharged from the joint. A large osteocartilaginous body was immediately encountered in the anteromedial joint space. This was removed. Inspection showed erosion of the tibial articulation of the femur, which measured 3.5 centimers in diameter (Fig. 2). There also was erosion of an area 2.5 cm. in diameter on the patellar articulation of the femoral condyle. The posterior surface of the patella was softened on its lower and lateral borders. A large osteocartilaginous body was removed from the lateral portion of the suprapatellar pouch. The eroded areas were curetted and scraped to bleeding bone. The cartilage on the patella and femur was smoothed with a scalpel. Erosion was palpable on the lateral femoral condyle at its patellar articulation. Hydeltra (1½ cc.) was injected into the wound before it was closed. A dry sterile dressing was applied, followed by sheet wadding and cotton elastic bandage from toes to groin.

FIG. 1. X-ray left knee joint before surgery. Large, partly calcified bodies in knee joint are revealed. Note body in region of weight-bearing surfaces.

ASSOCIATED TREATMENT PROGRAM

Physical therapy was initiated on the ward twenty-four hours after surgery. Static quadriceps setting, learned before surgery, was begun and repeated for five minutes each hour. Physical reconditioning of the uninvolved parts also was initiated at the bedside. Passive extension of the knee joint was insured by suspension with a sling placed at the level of the ankle. On the 4th postoperative day, straight-leg lifts, antigravity exercises for hip extensors and abductors, and active range of motion (ROM) exercises of the ankle were added.

On the 13th postoperative day, when the sutures were removed, moderate swelling of the knee was observed. Within the next week four aspirations of the joint were performed; the withdrawal of bloody fluid varied in amounts from 37 cc. to 122 cc. After the fourth aspiration, prednisolone (30 mg.) was injected into the joint. Cotton elastic bandaging from toes to groin was continued.

Treatment was begun in the Physical Therapy Clinic on the 16th postoperative day. In deference to the joint swelling no active ROM exercise of the knee was permitted; however, one passive ROM exercise was to be given daily. In an effort to develop strength of the quadriceps, the progressively prolonged isometric exercise described by Lawrence[1] was initiated. The patient was able to hold a 20-second isometric contraction of the left quadriceps for 10 repetitions, allowing a 15-second rest between repetitions.

In this exercise procedure the patient extends the knee completely, holding it in the fully extended position for the maximum *length of time* in which 10 such exercise movements may be repeated. The exercise is performed in the sitting position with the leg hanging over the edge of the treatment table. No resistance is used beyond the weight of the foot and leg held in the exercise position for progressively longer periods of time.

Upon his departure for a two-week holiday-leave (one month after surgery), the patient was instructed to continue the prolonged isometric exercise program. He was also instructed in the use of crutches and cautioned to place no more than 25 pounds of weight on the left lower extremity. In approximating the 25 pounds of weight to be placed on the extremity, the patient stood on a block, level with the top of standard platform scales, bearing all of his weight on the *right* foot. The block was positioned just to the right of the scale platform. With the weight indicator placed at the 25-pound mark, the patient balanced the scale by placing his left foot on the scale platform. After repeated practice of balancing the scale at the 25-pound mark, with and without visual check, the patient felt he could duplicate the amount in crutch walking. Use of normal gait was emphasized to the patient, with heel strike occurring first, and weight being transferred over the foot, followed by forefoot push-off.

When the patient returned from leave, examination revealed minimal swelling of the knee and evidence of slow and definite improvement. To determine strength of the quadriceps and tolerance of the knee joint to motion, as well as to plan the succeeding exercise program, weight-resisted knee extension was employed. Accordingly, the limit day procedure of DeLorme,[2, 3] Progressive Resistance Exercise (PRE), was administered bilaterally, *using the 1 Repetition Maximum (RM) only and reaching the determinations in the fewest possible repetitions of motion.*

The 1 RM's, determined on the 48th postoper-

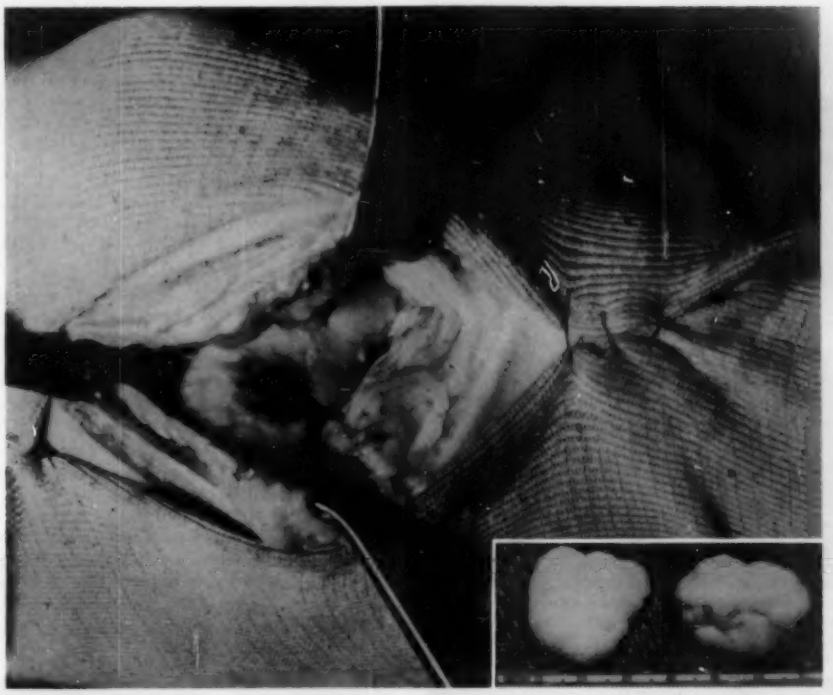

FIG. 2. Left knee at surgery. Note erosion of tibial articulation of femur. Insert shows free bodies removed from joint.

ative day, using the Elgin Exercise Table,* were 35 and 55 pounds on the left and right sides, respectively. It was decided to attempt a program of isometric contraction of the left quadriceps against progressively increasing resistance, *eliminating the weight and its attendant strain during joint motion.* At this time the patient also began occupational therapy consisting of treatment on a floor loom for light ROM exercises to the left knee.

PROGRESSIVE WEIGHTED ISOMETRIC EXERCISE

Since it was considered imperative to initiate some type of exercise for further strengthening of the quadriceps, the following program was devised. In attempting to minimize stress to articular surfaces and control joint swelling, *it seemed essential to eliminate motion of the knee joint completely while resistance was being applied to the muscle contraction.* In effect, despite the procedure of convenience to be described, the starting position for the exercise might be considered one in which the knee joint is completely extended.

Step One:

The patient is seated on the edge of a plinth with both lower extremities comfortably flexed to approximately 45 degrees at the knees and the feet supported on a stool. A 3-foot tube of stockinette, into the ends of which lead-shot has been sewn, is passed beneath the foot, then draped across the dorsum of the foot to come to rest on the stool (Fig. 3).

Step Two:

The patient is instructed to fully extend the left knee *without allowing the weights to leave the support of the stool* (Fig. 4).

* This does not constitute official endorsement of this product by the United States Army Medical Service.

FIG. 3. The first step of progressive weighted isometric exercise. (This picture and those of following exercise steps taken at the termination of treatment program, March 18, 1959.)

Step Three:

The lower extremity, *with the knee fully extended,* is lifted to a *position parallel with the floor* thus raising the weights off the stool (Fig. 5). Attention is given to assuming this position correctly with the lower extremity; this is the one in which the greatest effect of gravity (and weights) is exerted in the exercise load. Body balance is aided by the patient's placing both hands beneath the distal portion of the thigh.

Step Four:

As in Figure 5, a weighted isometric contraction of the left quadriceps is then maintained for 30 (or 45) seconds. The weight sustained during this period is the greatest amount with which 10 such contractions can be maintained when the exercise (Five Steps) is *repeated 10 times with a 15-second rest interval between each of the 10 contractions.*

Step Five:

The extremity with the knee fully extended is lowered to the stool.

Exercise was performed once daily, five times weekly. Exercise days were Monday through Friday. At each exercise period, the exercise (Five Steps) was repeated 10 times with a 15-second rest interval between each exercise. Progression

FIG. 4. The second step of progressive weighted isometric exercise.

FIG. 5. The third step of progressive weighted isometric exercise.

was made in weight or time sustained, according to the patient's ability on the basis of trial and error. A record of the patient's progress is shown in Table 1.

When the special exercise program was initiated, the patient was permitted to discard his crutches for short trips. He gradually increased the amount of unsupported ambulation until he walked without difficulty for rather long distances. At the end of the exercise program there appeared to be noticeable hypertrophy of the left quadriceps. Hypertrophy of the muscle was not thought to be necessarily related to strength development;[4] and girth measurements had not been taken. The patient was able to perform 1 RM of the left quadriceps of 40 pounds. The 1 RM of right quadriceps was 60 pounds. Thus, increase in strength of both exercised and unexercised quadriceps according to the 1 RM was 5 pounds. Minimal edema was present in the knee joint. Pain on stair climbing, which had been a persistent symptom, was relieved. The patient stated that the knee had a feeling of strength and stability.

Table 2 gives data on six other young male patients with whom the exercise was used as varying components of a total exercise program. Three patients had performed DeLorme type of PRE previous to this exercise program; one patient performed simultaneously. In the instance of the three patients' performance of De Lorme type PRE previous to this exercise program, the PRE was discontinued because of unsatisfactory progress. Progressive weighted isometric exercise was immediately begun. These cases have been selected because they represent problems closely observed by us. All had the common difficulty of recovering painfree function of the knee joint following injury. Three cases, in addition, revealed degenerative changes as demonstrated by established osteochondritis (Patient No. 1), and chondromalacia (Nos. 4 and 5). Four patients (Nos. 1, 4, 5, 6) had undergone arthrotomy of the knee joint. Two knee-joint arthrotomies had been necessary in Patient No. 1, and three arthrotomies in Patient No. 4. In Patient No. 5 reattachment of a torn anterior cruciate ligament had been formed. One patient

TABLE 1. Performance Record of Cpl. R.M. (progressive weighted isometric exercise to quadriceps)

	WEIGHT	LOAD INCREASE	TIME
Date	Exercise Load (pounds)	(per cent)	Contraction Maintained (seconds)
1/21/59	2½	..	30
1/27/59	4	60	30
2/6/59	4	60	45
2/9/59	5	100	30
2/13/59	8	220	30
2/17/59	8	220	45
3/2/59	12	380	30
3/6/59	14	460	30
3/13/59	16	540	30
3/18/59	17	580	30

TABLE 2. Exercise Program and Performance Record of 6 Patients after Injury of Knee Joint

	PROGRESSIVE WEIGHTED ISOMETRIC EXERCISE				PROGRESSIVE RESISTANCE EXERCISE		
	Exercise Load			Exercise Period	10 RM		
						Weeks	
Patient	Initial Pounds	Final Pounds	Increase (per cent)	Weeks	Initial Pounds	Prior to Isometric Exercise	During Isometric Exercise
1.	2	12	500	6	..	..	..
2.	2	6	200	3	..	..	..
3.	10	16	60	4	25	6	..
4.	10	14	40	3	30	5	..
5.	15	20	33	2	20	3	..
6.	6	14	133	5	*	..	5

* 10 RM taken at 3 intervals during exercise period with following comparisons: 12½ pounds at 10 pounds weighted isometric exercise; 30 at 12, and 32½ at 14.

(No. 3) had sustained fracture of the medial tibial plateau succeeded by open reduction. Two patients (Nos. 1 and 4) had complications of chronic synovitis; and one (Patient No. 3) had hemarthrosis. The remaining patient (No. 2) had not undergone surgery but was thought to have a latent medial meniscus tear. He performed the progressive weighted isometric exercise after a period of "provocative" exercise given in an effort to judge the necessity for surgery.

In this series of cases only minimal symptoms were present on discharge from the hospital. The only exception was Patient No. 1 who continued to exhibit moderate swelling; and he was placed on temporary retirement for periodic evaluation and treatment, as necessary. The others exhibited no joint swelling. Range of motion of the joint was normal except for slight limitation of flexion in three cases: Patient No. 3—25 degrees; Patient No. 4—15 degrees; and Patient No. 5—30 degrees. All walked well without support and had moderately good strength and function of the knee. One patient (No. 2) returned to duty; one patient (No. 3) was separated from the Service for physical disability; two patients (Nos. 4 and 6) were separated on the basis of the disability's existence before entrance on active duty; and one patient (No. 5) was discharged because of termination of enlistment.

On the basis of clinical observation, this type of exercise also has been employed in a fairly large number of cases with gratifying results from the standpoint of recovery of painfree function achieved by a comfortable exercise program. These cases have also included complicating injuries, degenerative changes of the knee joint, or those resistant to treatment for various reasons.

DISCUSSION

The progressive weighted isometric exercise, utilized in the treatment of the patient presented, differs from the progressively prolonged isometric tension exercise previously described. In the progressive weighted isometric exercise, static exercise was subjected to progressive variation in relation to the magnitude of resistance as well as the duration of isometric holding. In the progressively prolonged isometric tension exercise, static exercise was subjected to progressive variation in relation to duration of isometric holding *only*. No external resistance was applied in the exercise and only the unvarying resistance of the weight of the foot and leg was present. In both methods, dynamic exercise without resistance was performed as a preliminary through approximately the last 45 degrees of knee extension in order to assume conveniently the starting position for static exercise of the quadriceps.

The percentage of increase in muscle strength, according to weight sustained during the exercise, was high (580 per cent). From our clinical observation the efficacy would seem to be about of the same order as that demonstrated by using the classic DeLorme PRE.

The percentage of increase in muscle strength, as demonstrated with the 1 RM determination applied before and after the period of progressive weighted isometric exercise (Jan. 21—Mar. 18, 1959), was surprisingly small (14 per cent). This might be partially explained in two ways: *First,* before the training period, there may have been ability to sustain relatively greater amounts of weight for a short period as required in a 1 RM determination. This ability might be expected initially to exceed that required in the progressive weighted isometric exercise procedure, per se, applied as a test device. It should be remembered that in the progressive weighted isometric exercise procedure the greatest amount of weight is used which can be *sustained for a 30-second period* 10 times repetitively. *Second,* at the end of the training period, there may have been a reluctance on the part of the patient to undergo an all-out effort in this determination at a time when he was to be discharged from the hospital, inasmuch as previous resisted exercise associated with joint motion had seemed to increase joint swelling.

In a study of resisted isometric exercise in normal subjects, Liberson and Asa[5] reported an increase of 130 per cent in muscle strength, according to the 1 RM value. In this study subjects between the ages of 20 and 30 exercised the muscles of the hypothenar eminence over a 3-month period by a single 6-second isometric contraction per exercise session.

Since it seemed important with this patient to eliminate joint motion during exercise in an effort to minimize stress to articular surfaces, thereby reducing tendency to joint swelling, the method of brief maximal exercise described by Rose and co-workers[6] was not attempted.

Electromyographic observations for dynamic work appear to be equally valid for static work in terms of integrated electrical activity as described by Scherrer and Bourguignon.[7] Positive relationship between this electrical activity and strength development might be expected at least somewhat similarly in both types of work, if extended into an exercise program for this purpose.

It would be interesting to apply the exercise (isometric) load to the quadriceps with the knee in approximately 60 degrees of flexion, the position described by Williams and Stutzman[8] as the point in the "joint torque curve" where the muscle develops maximum force. This point in the joint range may also coincide with the point where maximum functional muscle strength is required. It was noted that the patient, reported in this case, complained of weakness and pain on ascending and descending stairs.

It is hoped that further studies in the near future may establish more specifically the comparative value of isometric contraction and thereby point out methods for optimum clinical use.

SUMMARY

1. A method of progressive weighted isometric exercise for strengthening the quadriceps femoris has been presented.

2. This differs from the progressively prolonged isometric tension method previously described. Static exercise was subjected to progressive variation in relation to magnitude of resistance as well as duration of isometric holding. Dynamic exercise was performed without exercise load through an arc of motion consisting of approximately the last 45 degrees of knee extension in order to assume conveniently a desirable starting position for static exercise of the quadriceps.

3. The method of exercise was devised with the objective of building functional strength of the quadriceps femoris muscle in the postsurgical treatment of a patient with severe osteochondritis and chronic synovitis of the knee joint. In devising the exercise, the need for building strength of the muscle group, while admitting the least possible stress to articular surfaces of the knee joint, was considered of primary importance.

4. A series of six other patients (with complicating injuries and degenerative changes of the knee joint for whom the exercise method was also employed) was presented in less detail.

5. It is felt that the described exercise method fulfilled the objective of building functional muscle strength in these problem cases of involvement of the knee joint.

ACKNOWLEDGMENT: The authors wish to express sincere appreciation to Major William G. Phippen, Chief of Orthopedic and Physical Medicine Services, Valley Forge Army Hospital, under whose guidance the exercise program was devised and carried out. Sincere appreciation is also extended to the patients who participated and to all members of the Physical Therapy Staff for much assistance and willing cooperation. We should also like to thank Dr. Frances A. Hellebrandt, University of Wisconsin, for reviewing the manuscript and offering helpful suggestions.

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*Exercise in a Weightless Environment**

Pauline Potts, Captain, USAF, MSPC, and J. I. Bowring, Wing Commander, M.B.E., RAF

All persons who have studied exercise therapy are aware of the importance of joint position and gravity. Normally, a person exercises *against* gravity, with gravity *assisting*, or with gravity neutralized insofar as is possible. Now an additional situation has arisen, that of exercising when *no force* of gravity exists. This is referred to as a weightless condition.

The citation of a few examples will depict what happens in a weightless situation. If a person raises his upper extremity in forward flexion, it will continue on to 180 degrees or until it hits an object and stops. When he exerts force to use an ordinary screwdriver to turn a fixed object, the screwdriver will remain motionless and his body will rotate around it. Without restraints, he will move about much like a swimmer under water until he hits an object and stops. With his eyes closed, he cannot orient himself as to *up* and *down*.

Research on this weightless environment is being performed at the Wright Air Development Center, Wright-Patterson Air Force Base, Dayton, Ohio. A few of these research projects concern food, elimination, clothing, rest, recreation and exercise for the crews of future high performance flight vehicles. Many answers have already been determined by attaining a weightless environment for short periods of time.

RESTRAINED SITTING

In the future, crews of three, four or five men may be confined to a small area. They must work, eat, sleep and exercise in an area of approximately 80 cubic feet of space per crew member. All this will take place in a weightless environment. Restrained sitting for long periods of time is necessary for working, exercising and eating. This, then, raises the question as to what type of chair can be developed for combating weightlessness.

A chair was made of nylon rochel mesh that could be adjusted to eliminate pressure areas when used by different sizes of subjects. Attached to the chair is a mesh vest also made of rochel knit nylon. This vest, as well as mesh bands over the femurs, are necessary for the restraint of the man in a weightless condition.

While experimenting with subjects who sat for periods of time up to 24 hours, the pressure areas and their degree of pressure were determined by mathematical calibration. Fatigue and discomfort started in the gluteal region, spread to the lumbar area, and finally to the cervical area.

* This paper represents the personal viewpoint of the authors and is not to be construed as a statement of official Air Force policy.

Captain Pauline Potts was until recently assigned to Wright-Patterson AFB, Ohio. Current assignment is Physical Therapy Section, USAF Hospital, Lackland, USAF Aerospace Medical Center (ATC), Lackland Air Force Base, Texas.

Wing Commander Bowring is Project Officer, Crew Station Design Section, Special Projects Branch Aircraft Laboratory, Wright Air Development Center, Wright-Patterson AFB, Ohio.

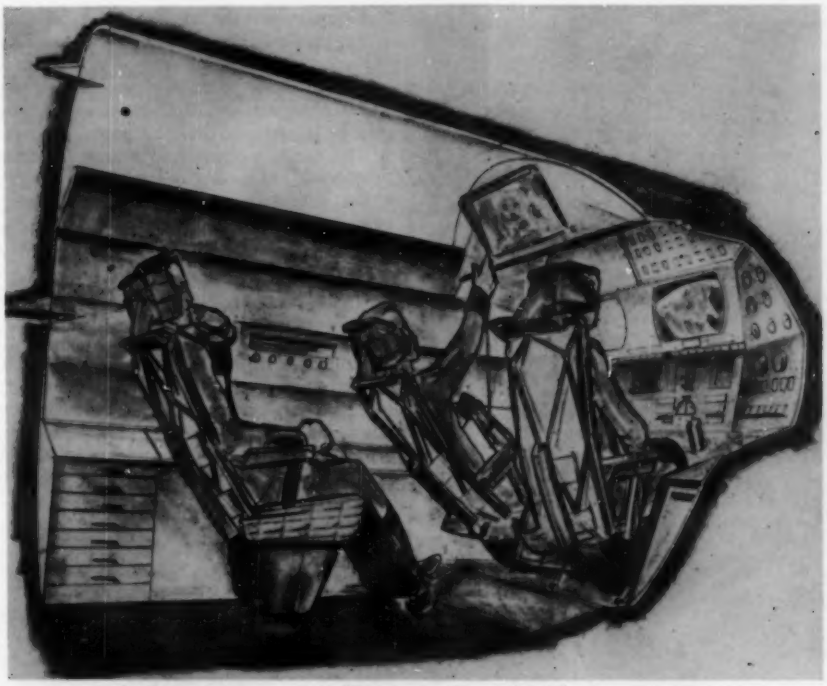

FIG. 1. This shows the crew area. The crewmember on the right is operating instruments. The center crewmember is watching television. Note the cuff and cable attached to the right upper extremity and the arm rest. The crewmember on the left is eating from a scientifically designed food container. The picture does not show the foot board that is attached to each chair.

The experimental chair was tested by persons who sat not only for long periods in a stationary position, but also on the centrifuge, and no discomfort was reported under either condition.† However, this created a problem. The persons used in testing the chair became so relaxed that they did little or no exercise, not even shifting the body weight from one buttock to the other.

After establishing the optimal seating arrangement, the question arises as to the best position of the upper extremities. Factors such as comfort, exercise, and work arrangement are kept in mind. Observation of people in churches, theatres, and restaurants reveals that most people sit with their hands crossed in their laps or with their arms folded against their chests. It was decided that the arms were to be placed on armrests in an abducted and internally rotated position. The arm-rests are adjustable to different body sizes, and support is given to the entire upper extremity. The arms are restrained by take-up reels mounted in the arm-rests. The reels are connected to the arms by means of lightweight cables and cuffs around the wrists and forearms. Not only will the take-up reels and cuffs serve as a restraint, but it may be desirable to simulate a feeling of 1 G force—1 G being the gravitational pull on the earth. This same device also will serve as the exercise unit. It should be kept in mind that all exercise must be done in a restrained, sitting position.

DIAL FOR RESISTIVE FORCE

The unit is so devised that the crew member can adjust a dial at his finger tips to effect the desired amount of resistance for exercise. The unit will give up to 3 G or 96 pounds of resistance. After pulling against resistance, the same resistive force will function as gravity, bringing the extremity back to its original position.

† This chair has been found very comfortable by disabled persons who are required to sit for long periods of time. Though specifications are not available for commercial production, disabled persons can obtain information about the chair by writing Wing Commander Bowring.

FIG. 2. Artist's concept of the chair used in high performance flight vehicles. The lower extremity support is not shown.

The crew members must be taught to exercise specific muscles and groups of muscles. By the use of the cuffs and take-up reels, resistive exercise can be given to all muscles of the shoulder girdle and upper extremity, except the flexors and extensors of the fingers and the intrinsics in the hands.

Support is provided for the entire lower extremity with the foot resting on a foot board. All muscle groups of the lower leg can be exercised by the foot board, which has a spring attachment.

Equipment to be used in exercising the muscles that act on the knee and hip joints is the same type of mechanical device as is used for the upper extremity. The cuff is attached to the distal third of the leg. In the sitting position, however, no resistive exercise can be given to the knee flexors and hip extensors. Static exercise routines will be taught for all muscles and muscle groups. In addition, tensing of specific muscles or muscle groups and their antagonists, simultaneously, will be used.

Exercise for the quadriceps brings up an interesting situation. When sitting with the lower leg unsupported, the force of gravity of 1 G will carry the knee to a 90-degree angle of flexion. From observations of tests in a weightless condition, it appears that the angle of knee flexion in the same unsupported sitting position is approximately 135 degrees extension, 180 degrees being complete extension. Therefore, it is assumed that the leg support position should be at this angle. It will be adjustable to 90 degrees for exercising the quadriceps.

STATE OF SUSPENSION

The crew members will have work to do, inasmuch as this is the reason for their being in a weightless environment. Work, however, creates a need for diversion and, after scientific consideration, it has been decided that the crew will have a television screen for microfilmed television shows and books. In addition, cards, chess,

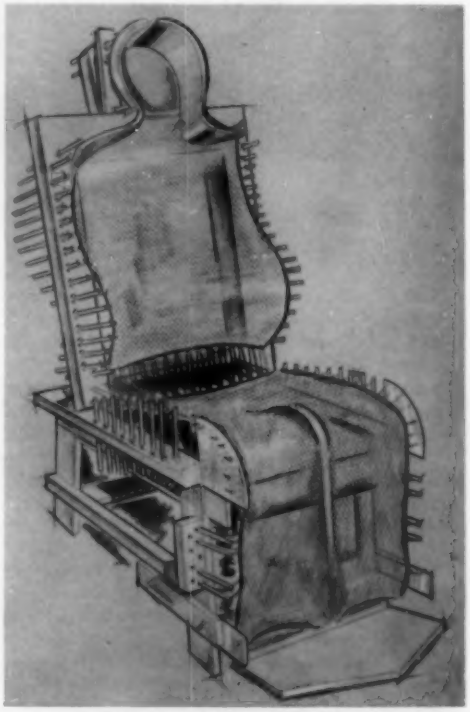

FIG. 3. This is a drawing of the experimental chair described in the article. The drawing does not show the vest, arm rests or lower extremity restraints.

checkers and other activities will be available. These games, of course, will have to be magnetized. Several questions arise with respect to work or diversional activity. Should exercise be a work activity or a diversional activity, or should it encompass both? How often should exercise be given? What resistive exercise formula should be used? Regardless of how the program is arranged, the exercising factor will be of paramount importance.

When the crew member leaves his chair to go to the other areas of the cabin, he must hold onto handrails or he will float around the cabin. When floating, his movements resemble those of a swimmer under water. It is observed that in this state of suspension or floating, the extremities move in a horizontal plane. Should an exercise regimen be developed on this basis?

Of equal importance to the weightless exercise program is the program for evaluating the crew members after they return to the 1 G situation. How much muscle power was lost during the period of limited activity? The psychological and physical acclimatization in leaving and entering such an environment will require extensive evaluation by many professional groups.

Numerous questions concerning exercise in a weightless environment need to be answered, and only through constant and continual research are these questions being answered.

Facilitation Technics in Lower Extremity Amputations

Margaret Knott, B.S., and Sedgwick Mead, M.D.

Facilitation patterns have been widely used in many kinds of disabilities. Several suggestions for treatment in patients with amputations will be described for better clarity in the application of these patterns.

In all amputations careful attention is given to the contractures or limitations in range of motion. If these limitations present themselves, cold applications may be used as a preliminary procedure for relaxation. A turkish towel wrung out of ice water at a temperature of no more than 58 degrees Fahrenheit may be applied. The turkish towel is immediately placed on the area of limited joint range for only a few minutes. For the best results, towels should be changed several times to maintain the coldest temperature, and they should be placed over the entire muscle, which has been carefully covered from its point of origin to its insertion, especially when it crosses over a joint.

While the cold applications are being applied, relaxation technics can be carried out in one of two ways. The patient may be asked to contract maximally with an isotonic contraction in the direction of the "tighter" patterns, or he may be asked to hold maximally in the direction of the tighter pattern with an isometric contraction. With either of these contractions little or no motion is allowed to occur. The contractions of the tight muscle groups are followed by the patient's voluntary effort to relax, after which the involved part may then be moved passively into the antagonistic pattern. This procedure can be repeated a number of times to increase the passive range of motion. This approach is advised in lieu of manual passive stretching.

Following the preliminary procedure, emphasis should then be placed on reeducation through an exercise program. Since most patients go through a period of bed rest after the surgical procedure, some disuse atrophy is present even in the good extremity. The first step is to give the patient maximal resistance to all patterns of motion on the intact extremity. Several desirable responses can be accomplished by this procedure: (1) hypertrophy of the good extremity; (2) recipro-

From the California Rehabilitation Center, Vallejo, Calif.

cal relaxation and/or facilitation achieved on the opposite side; and (3) teaching the patient what may be expected of him when exercising the amputation stump.

Once all patterns of the normal extremity have been carried out successfully against resistance, and strength has improved, it is advised that lower and upper trunk patterns be done. The trunk patterns in the lower extremity amputee are of extreme importance because they influence directly the patient's ability to use his prosthesis well. Usually, trunk motions toward the amputated side show greater weaknesses and sometimes limitation in range. For best results we feel that particular emphasis needs to be placed on lower trunk flexion patterns. In carrying out these patterns the amputated extremity is resisted in the same manner as the opposite extremity; that is, the patient is asked to do asymmetrical motions of the lower extremities. It is obvious that the resistance on the distal parts would be different on the two sides. Only patterns of the intact extremity and trunk may be done for a few days before any specific exercises are done with the stump.

SURGICAL PROCEDURES

Thus, in order to understand why we suggest specific motions for the stump, some of the surgical procedures are discussed briefly. Klopsteg and Wilson have described several types of amputations.[5] In the "closed amputation" the muscles are first allowed to retract, while the bone is sawed, and are then redrawn to their original length. They state that the muscles subsequently become reattached to the bone and fascia by fibrous tissue and hence become fully available for forceful movements of the stump. These procedures are used on thigh and leg amputations. Another surgical procedure is the Gritti-Stokes amputation: a disarticulation at the knee, which has been used from time to time for over a hundred years. An anterior flap is made, extending as far down as the tibial tubercle. The posterior flap is made long enough so that the hamstrings can be sutured to the patellar tendon in the notch between the femoral condyles. The notch is filled and the hamstrings and patellar tendons are so attached that the muscles will not retract and separate the suture line.

RESISTIVE EXERCISE

After trunk patterns are performed well by the patient, the amputated extremity should be exercised against maximal resistance, using patterns of facilitation. In view of the amputations described, attempts should be made to do the entire range of all patterns of the extremity. In below-knee amputations equal emphasis should be put on the foot and ankle motions as though these parts were present; whereas, in above-knee amputations, motions of the knee should be given equal consideration to that of the hip. These suggestions are made to help the patient maintain muscle tone in all remaining muscle groups. These motions can still be initiated by the patient to help with the shaping of the stump. Particular emphasis on patterns requiring motion of muscles involved in the amputation seems advisable. We have had occasion to note too that muscle cramps, experienced in the phantom limb, often can be reduced by following a contraction with relaxation. The patient attempts to carry out motions where the cramps exist while the physical therapist gives manual resistance to the stump. Irradiation, or so-called "overflow," to the distal parts will occur if maximal resistance is given to proximal muscle groups.[6]

In giving maximal resistance to the stump itself, the same skilled patterns need to be done as in any other disability. Special emphasis should be given to the rotary components. It is more difficult to give adequate resistance because of mechanical disadvantages; however, the best results are obtained when the physical therapist resists the patterns with proper timing. The timing is accomplished by bringing in the strongest muscle groups first, and then equalizing or matching their resistance without allowing motion to occur. After the strong groups are matched in resistance, motion is allowed to occur in the other components of the pattern. For example, in the above-knee amputation, in doing the pattern of extension-abduction with internal rotation of the hip, the matching resistance can be given to the internal rotators first. Motion then can be allowed to occur in the diagonal direction of extension and abduction; and maximal resistance can be applied throughout the range of motion. Another example, in the below-knee amputation: in doing the hip extension with knee flexion pattern, the matching resistance can be given to the hip extensors and abductors with the certainty that the patient is contracting these maximally and maintaining the contractions. Motion can then be allowed to occur in knee flexors in a diagonal direction.

TECHNICS

Many technics can be utilized in treating amputees: namely, repeated contractions, slow reversals, rhythmic stabilization or relaxation technics.[2] Supplementary to this exercise program

using patterns of facilitation against maximal resistance, we have found other activities helpful in speeding up the patient's progress in handling his prosthesis. Resistive balancing activities can be carried out, prior to the actual wearing of the limb, with the patient in the parallel bars or on crutches.

Such activities should be started with resistance given to standing balance, and with the physical therapist grading the resistance according to the patient's tolerance. One might start with resistance at the shoulders, then at the pelvis. Rotation in conjunction with resistance, forward and backward, speeds up the increase in strength and facilitation of all groups of muscles. After the limb is fitted, and the patient is allowed to use it, the resistive procedures can also be performed. It is preferable to start with the patient in the parallel bars, progressing to crutches, and then to a cane, as the stability of the patient improves. It is our belief that resistive standing balance should always be done before ambulation.

Whenever the patient actually starts walking, resistive gait activities can be started with maximal resistance given to forward, backward, or sideward motions of the patient. This can be done by applying the pressure at the shoulder or pelvis. Resistance has to be graded and may vary from assistive-resistive to maximal resistive motions. It may also be started in the parallel bars, then done with crutches or a cane, or finally without support as the patient improves.

In these procedures for standing and walking it is felt that so great a demand is placed on the patient's gross activities that he is forced to use all muscles, and in bringing all of these groups into play, his strength, as well as his control, will increase more rapidly. It is our feeling that the patient adjusts more quickly to his prosthesis by following these resistive activities for balance first and for ambulation later.

SUMMARY

The use of patterns of facilitation against resistance are applicable in the treatment of the lower extremity amputee. If limitations in range of motion exist, then cold applications can be used effectively in gaining an increase. For better results in increasing range of motion, cold applications can be used in conjunction with relaxation technics. In an exercise program emphasis should first be put on the non-amputated extremity, succeeded by trunk motions. This may be carried on for a few days or a week. Once the uninvolved extremity and trunk motions are performed well, specific patterns should be used on the amputation stump.

Resistive balancing can be done in parallel bars or on crutches even before the patient is fitted with a prosthesis. Once the patient has his prosthesis, resistive balancing can be done. Resistive walking in all directions can be carried out after good balance has been achieved.

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Case Reports

Postsurgical Treatment for Claw Toes

Dean P. Currier, M.A.*

The lateral and medial plantar branches of the posterior tibial nerve are commonly affected in patients with leprosy. The nerve lesion is usually distal to the medial malleolus, and thus results in paralysis of the intrinsic muscles of the foot. Owing to this paralysis, the *flexor digitorum longus* pulls on the distal phalanx causing clawing or hammer toe deformity, in which the proximal phalanx is extended and the middle and distal phalanges are flexed. Congenital or familial defects, poor fitting shoes, injuries, and paralysis from disease, are other causes of claw toe deformity.[1]

A 41-year-old male with active lepromatous leprosy was admitted in November, 1945, with anesthesia of both lower legs. Bilateral hypoactive tendon reflexes were noted in 1953; and mild flexion of the interphalangeal joints of four toes on the left foot was observed for the first time in November, 1954. Several calluses on the soles of the feet and the ends of the flexed toes of the left foot were noted in November, 1956. Surgery was recommended for the flexion contractures of the proximal interphalangeal joints of the great, second, third, and fourth toes of the left foot. The fifth toe on the left foot and all toes on the right foot were normal.

An operation was performed December 11, 1956, on the four toes of the left foot. The surgical procedure consisted of transference of the *flexor digitorum longus* tendon to the extensor tendon in the proximal segment of the toe, which resulted in extension of the interphalangeal joints, together with release of the pull of the *flexor digitorum longus* on the distal phalangeal joint.[2]

On January 14, 1957, the cast and sutures were removed and physical therapy was begun. Since weight bearing was contraindicated, the patient was confined to a wheel chair. During this time he had twenty minutes of whirpool followed by massage and exercise, daily.

Whirlpool was instituted for debridement of the necrotic tissue and to aid healing of the incisions. Incisions closed completely after the first few whirlpool treatments.

Friction massage, enabling the skin to slide easily over the underlying tissues, helped to prevent or loosen adhesions around incisions, whereas general massage was administered when edema and muscle spasm were present.

Passive exercise and muscle reeducation were part of the first five treatments. Passive exercise was used to reduce resistance in extension by stretching the short flexors and to relieve stiffness of the ankle; and muscle reeducation was used to develop active toe extension by use of the transferred tendons. During the early stages of reeducation the muscle action was encouraged by having the patient perform the movement in which the muscle acted as a synergist. After the fifth treatment (January 22), massage, passive exercise to the ankle, and muscle reeducation were discontinued. Adhesions had loosened, edema had vanished, and stiffness of the ankle was alleviated. Muscle reeducation was discontinued because the patient readily learned the new functional pattern. Active exercise to promote coordination in the transferred muscle tendons began January 23. Thereafter, passive and active exercise for toe extension and whirlpool were given.

After three weeks of treatment, metatarsal inlays were placed in the shoes of the patient to relieve weight-bearing pressure from toe tips and metatarsal heads, and to reduce the possibility of calluses. The patient immediately began limited walking. This steadily increased, without incident, to unlimited ambulation. After a series of fourteen physical therapy visits during which attendance was irregular, treatment was completed on February 12, 1957.

There were no incidents to mar recovery. Three years later the patient had experienced no further difficulty with the left foot.

* Chief, Physical Therapy, U.S.P.H.S. Hospital, Carville, La.

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The *Review* invites case reports from physical therapists who have followed an interesting course of treatment with or an unusual response to treatment by patients having one of the conditions listed below.

Diabetic neuropathy
Paralysis agitans—postchemopallidectomy
Volkmann's ischemic contracture
Dupuytren's contracture
Osteoarthritis
Coronary thrombosis
Cerebral palsy with sensory disturbance
Postmastectomy lymphedema

Note: Suggestions for preparation of case reports were published in the October 1957 issue of the *Review*, pages 666-667. Reprints of the suggestions may be requested by writing to the *Physical Therapy Review*.

Suggestions from the Field

Improved Method for Fitting Crutches and Canes

Jay Davenport*

Valuable time is lost through trial and error when adjusting axillary crutches and wooden canes to the physical requirements of the patient. An imperfect fitting is often the result when time prohibits a final dismantling and readjustment. Correct fittings, however, can be made at the time of the first adjustment by employing the following methods:

An unmatched or discarded crutch can be adapted for use as a measuring device (Fig. 1). Three ¼-inch slots are cut lengthwise into the parts of the crutch where the series of holes is located. The face of the crutch is calibrated to represent the various possible positions.

The relationship between the hand-piece and the crutch-end can be adjusted simply by loosening the wing-nuts and sliding the parts up or down. When the correct angle of the patient's elbow and the desired crutch-height have been determined, the wing-nuts are tightened. The fitting may be done with the patient in a standing or supine position, depending upon his condition. It is then a simple matter to match the adapted crutch against the crutches that are to be used for actual weight bearing.

The cane adaptation (Fig. 2) requires little explanation inasmuch as it is used in the same manner. The cane is sawed lengthwise. Two small holes are drilled into the piece that contains the handle; and a slot ¼ inch wide (12 inches long) is cut into the lower piece. Two small bolts with washers and wing-nuts are used to secure the cane at the length required.

Before the patient is "measured" for either crutches or a cane the purpose of these devices should be explained so that he may avoid using them for actual weight bearing.

* Assistant Physical Therapist (Regular), U.S.P.H.S., Outpatient Clinic, New York.

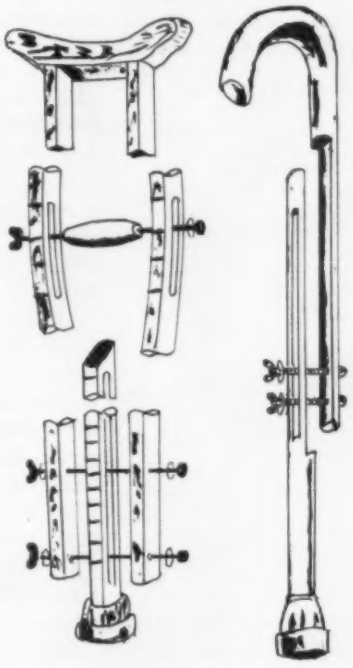

FIG. 1. (left) Unmatched crutch adapted as a measuring device.
FIG. 2. (right) Cane adaptation.

Proprioceptive Neuromuscular Facilitation Film

A 35 minute color film with sound is available to chapters and schools of physical therapy at a rental fee of $10.00. One copy of the film has been given to the Association by the California Rehabilitation Center. Requests from states east of the Mississippi should be directed to the American Physical Therapy Association, 1790 Broadway, New York 19, New York; rental is payable to the American Physical Therapy Association. Those west of the Mississippi should write to California Rehabilitation Center, 2600 Alameda, Vallejo, California; rental is payable to the California Rehabilitation Center. All requests should be submitted two weeks in advance of date of showing. Alternate dates are desirable since both copies may have prior bookings.

Editorial

Eighth World Congress, ISWC

The theme of the Eighth World Congress of the International Society for the Welfare of Cripples, "REHABILITATION AND WORLD PEACE," is of even greater significance today and offers a greater challenge than it did when it was selected three years ago.

More than 5,000 registrants are expected when the Congress convenes in New York City on August 28. Fifteen hundred of these will be from outside the United States and Canada, representing at least 50 countries.

Despite global political tensions, the delegates will be meeting as friends and colleagues. Their aim—the traditional one of the Society (ISWC) since 1922—is to stimulate and develop services for the restoration and training of the world's disabled men, women and children. Included among those attending will be members of many professional groups—physicians, occupational therapists, physical therapists, prosthetists, social workers, administrators, educators, and vocational counselors. There will be officials of national governments of the United Nations and its specialized agencies; dedicated laymen, the backbone of the voluntary movement, from the ISWC affiliates throughout the world, many of whom are disabled themselves; and other voluntary agencies concerned with disablement.

The World Confederation for Physical Therapy (WCPT), since its founding nine years ago, has been pleased and proud to participate in the International and Regional Congresses of the ISWC. Moreover, everyday working relationships have been developed and expanded at both the international and affiliate levels since fundamentally our aims are identical. This year the World Confederation will present a map exhibit to identify the countries in which physical therapy services have been given. In the past nine years many of these programs were stimulated by the International Society through its local affiliate, even though later the program may have been sponsored by the World Health Organization (WHO) or United Nations (UN). It should be remembered that national governments must request assistance of UN; and such requests are usually the result of a demand by interested citizens of their countries.

More than 100 physical therapists have given service in 43 countries. Five training programs, schools of physical therapy, have been

organized as well as several short-training schemes to meet emergency needs.

In addition to this direct service, many of the World Confederation member organizations have welcomed and assisted trainees from other countries in basic and postgraduate training, clinical experience, and observation. The APTA exhibit will show how one member organization has contributed to better services to the world's handicapped through its special programs for non-nationals.

Wherever a physical therapist serves throughout the world, instructive informational material in several languages and a large selection of films are available to him through the ISWC. Just this past year, the ISWC generously provided funds to the WCPT for the printing of "*Suggestions for a Physical Therapy Program*," in French and in Spanish for global distribution.

To each of us individually and all of us collectively, the Eighth World Congress will be significant. It will demonstrate that from the East and West, North and South, and beyond any geographical or political boundaries, we can meet and learn from each other, enjoy one another, act with great determination to bring rehabilitation services to more of the disabled, and through unselfish service and understanding bring peace to us all.

MILDRED ELSON

EDITOR'S NOTE: Miss Elson served as Executive Director of the American Physical Therapy Association from 1944 to 1956. The Founding President of the World Confederation for Physical Therapy, Miss Elson is presently a member of the Eighth Congress Planning Committee, ISWC.

The Association's Film, *The Return*, Is a World Traveler

The Return has been shown in Australia, Canada, England, France, Haiti, Ireland, Japan, Mexico, Russia, Switzerland, and Venezuela.

It has been shown at the following international meetings: Cuarta Conferencia Interamericana Sobre Rehabilitación, San Juan, Puerto Rico, 1959; Third Congress of the World Confederation for Physical Therapy, Paris, France, 1959; and will be shown at the Eighth World Congress of the International Society for the Welfare of Cripples, New York, 1960.

Do you use it to help you interpret physical therapy to your community?

A complete listing of the film libraries where the Association's latest film is on deposit may be found on page 99 ff. of the February, 1959, issue of the *Physical Therapy Review*. If the film library nearest you cannot supply you on the date you need *The Return*, look through the list to see if another library will service your state. National Office will send you a print if it is unavailable locally. In addition to the 38-minute version, there is a TV version running 28 minutes. There is also a 58-second TV spot with sound track, excerpted from *The Return*. Both of these are available for borrowing from the National Office. *The Return* was chosen by Howard Thompson of *The New York Times* as one of the 10 best nontheatrical films of 1958.

Eighth World Congress, ISWC

Excerpts from Preliminary Program

The Eighth World Congress of the International Society for the Welfare of Cripples will be held in New York, N. Y., from August 28 to September 2, 1960. Headquarters for the Congress will be at the Hotel Waldorf-Astoria. Sessions will be held at the Waldorf-Astoria, the Belmont Plaza, and the Roosevelt Hotels.

The theme of the Congress is "Rehabilitation and World Peace."

The Eighth World Congress will be open to persons from all countries who are interested in the field of rehabilitation and who wish to attend. It is not necessary for a person to be an official delegate of a governmental or voluntary agency in order to participate in the Congress.

HOST SOCIETY:	The National Society for Crippled Children and Adults.
REGISTRATION:	The Eighth World Congress Office, 2023 W. Ogden Ave., Chicago 12, Ill.
FEE:	$15.00.
OFFICIAL LANGUAGES:	Simultaneous translation will be provided in the official languages of the Congress —English, Spanish, French, and German.

Sunday, August 28

10:00 A.M.— 4:00 P.M.	Tours of the United Nations Building
8:00 P.M.	Opening Session of the Eighth World Congress

Monday, August 29

9:30 A.M.—11:00 A.M.	**First General Session** "Rehabilitation and World Peace—Keynote Address" HOWARD A. RUSK, M.D., New York, N. Y. "The Place of Persons with Disabilities in Society" GUDMUND HARLEM, M.D., Oslo, Norway
11:15 A.M.—12:30 P.M.	**Sectional Meetings** "Progress and Needs in Rehabilitation"
2:00 P.M.— 4:00 P.M.	**Discussion Groups** "Economic Aspects of Rehabilitation"

Tuesday, August 30

9:30 A.M.—10:30 A.M.	**Second General Session** "Organizing to Meet the Challenge of Crippling Disease" HONORABLE ARTHUR S. FLEMMING, Washington, D. C. ABRAHAM HORWITZ, M.D., Washington, D. C. GEORGE F. DAVIDSON, Ottawa, Canada
11:00 A.M.—12:30 P.M.	**Sectional Meetings** 1. Neurological Disorders 2. Orthopedic Disorders 3. Problems in the Rheumatic Disease Field 4. Industrial Medicine and Rehabilitation 5. Rehabilitation Programs for the Aging 6. Speech and Hearing Problems 7. Leprosy 8. Plastic Surgery 9. Progress in Cardiovascular Disease
11:00 A.M.—12:30 P.M.	**Special Session** "Preparation of Children and Youth for Work and Living"
2:30 P.M.— 5:00 P.M.	**Special Session** "Volunteers—Their Role and Their Training"

Wednesday, August 31

Open for Special Meetings of International and National Organizations Interested in Rehabilitation, and for Tours to Local Facilities

Thursday, September 1

9:30 A.M.—11:00 A.M. **Third General Session**
"The Contribution of the Handicapped to the World Economy"
MARY SWITZER, Washington, D. C.
ARIEH L. FINK, Tel Aviv, Israel
AARON N. SOLOMON, Somerville, Mass.

11:30 A.M.—12:30 P.M. **Fourth General Session**
"The Contribution of the Handicapped to World Understanding"
LEONARD W. MAYO, SC.D., New York, N.Y.
SIR HARRY PLATT, LL.D., M.D., M.S., F.R.C.S., F.A.C.S., Manchester, England

2:00 P.M.— 5:00 P.M. **Special Session**
"The Role of Voluntary Agencies in a National Rehabilitation Program"

2:00 P.M.— 5:00 P.M. **Special Session**
"Opportunities for Professional Growth Through Recruitment and Training"
RUDIE AGERSNAP, President, World Confederation for Physical Therapy, Copenhagen, Denmark
NORMAN ACTON, Paris, France
CATHERINE WORTHINGHAM, PH.D., New York, N. Y.

2:00 P.M.—5:00 P.M. **Special Session**
"Determination, Evaluation, and Rating of Disabilities"
DR. MIGUEL ANGEL AGUILERA, Guatemala City, Guatemala
KONRAD PERSSON, Stockholm, Sweden
DR. OLE REMVIG, Hornbeck Kurbad, Denmark
DR. WILLIAM ROEMMICH, Baltimore, Md.
C. G. MAGEE, C.B.E., F.R.C.P., London, England

7:00 P.M. **Congress Banquet**

Friday, September 2

9:30 A.M.—10:30 A.M. **Fifth General Session**
Introduction, Newly Elected Officers, International Society Presentation of Awards

11:00 A.M.—12:00 Noon **Final General Session**
Panel Presentation
"The Meaning of the Congress"
PERCY C. MURRAY, Rio de Janeiro, Brazil
DEOGRACIAS J. TABLAN, M.D., Manila, Philippine Republic
B. EPSTEIN, Pretoria, Union of South Africa

Closing Address
"The Contribution of This Congress to World Peace"
HENRY H. KESSLER, M.D., West Orange, N.J.

APTA 1960-61 Dues Payable Now

Annual dues were payable May 1. To avoid loss of membership privileges and to receive the *Physical Therapy Review* without interruption, prompt payment is necessary. Your immediate response will be appreciated as a service to the Association.

Association News

Advisory Committee
Department of Professional Services

If ever we needed additional proof that the AMERICAN PHYSICAL THERAPY ASSOCIATION is an organization for, by, and with physical therapists, we can find this proof in the functioning of our members on advisory committees. The Advisory Committee is keenly aware that the Department of Professional Services in our National Office is vitally concerned with *you*: the practicing physical therapist. Your working problems, solutions, and opportunities for future growth are all part of this department's responsibilities.

This is the department whose field work provides advisory services to administrators of physical therapy services by helping to establish and develop these services in communities. It serves the physical therapists in guiding them toward meeting changing needs in their programs. It recruits therapists during poliomyelitis emergency periods, and recruits personnel for special projects such as the recent Moroccan situation; it conducts a placement service for members, as so many of you well know, and provides guidance for foreign-trained physical therapists. Quite naturally then, under this broad shelter of concern for *you*, the Advisory Committee finds itself involved in several major projects as well as its other concerns.

The Advisory Committee consisting of Mrs. Ann S. Craig, Chairman, and Marguerite DuRette, Betty O. Nichols, Daniel H. Strelnick and Elizabeth J. Davidson, at their last four-day meeting in New York, February 22-25, worked with the National Staff members, Lucy Blair and Lillian Chabala, Consultants for The Department of Professional Services.

One major project that occupied a good portion of the four days was the developing of a manual of personnel policies for the physical therapist. It is in the fourth-draft stage, but it is hoped that when presented, it will serve as a useful tool for the therapist in the field. Another major project is the revision of the manual "Non-professional personnel in the Physical Therapy Department."

Because of the anticipated withdrawal of financial support by grant funds, the Advisory Committee has explored resources for the maintenance of the vital services offered by this department inasmuch as its responsibilities to physical therapists in the field are constantly expanding. Part of the immediate picture will be a streamlining of the placement service which, up to the present, has been highly personalized. Financial complications and implications were reviewed and it was recognized that supplementary funds may be necessary, especially for the development of special projects.

The Advisory Committee has wrestled with the problem of recognizing many changing trends in medical care—particularly in the fields of long-term and home care for the aged, and in the extension of the services of the community physical therapy departments to complement the rehabilitation center. These developments bring with them anticipated changing roles of the physical therapist and the added problem of how to best prepare our physical therapists with additional skills to meet with confidence the events that may take place.

Since the implications of these various trends and courses of action cut across the present responsibilities of the other departments of the AMERICAN PHYSICAL THERAPY ASSOCIATION, it seems important that all advisory committees meet periodically, exchange minutes and discuss items of mutual concern. This was initiated when the Judicial Committee met with the Advisory Committee one afternoon of our four-day meeting, and when Sarah Rogers, Consultant to the Department of Professional Education, gave this Committee a report on graduate study programs.

It is most revealing to work on one of the advisory committees and to see at first hand the tremendous amount of work that goes into the functioning of one of the major departments of our organization. If this experience should be offered to you, DON'T WALK—LEAP! at the opportunity to serve. In reality, the Board of Directors is bestowing a favor by asking you.

ELIZABETH J. DAVIDSON
Recorder

Marriages

Dale Adams, of Fort Smith, Ark., now Mrs. Dale A. Saenz, Berkeley, Mo.
Barbara L. Baier, of Waterbury, Conn., now Mrs. Barbara B. Bartosenski, Fort Worth, Texas.
Zoe Birren, of New York, N. Y., to William H. Kirby, New York.
Charlene E. Bunch, of LaCanada, Calif., now Mrs. Charlene B. DeRosier, Pasadena, Calif.
Ann C. Drisko, of Hollywood, Calif., now Mrs. Ann D. Malner, LaHabra, Calif.
Janet Ferguson, of Cincinnati, Ohio, to William H. Rodgers, Cincinnati.
Edna Gankerseer, of Vallejo, Calif., to J. Giovanelli, Mosman, N.S.W., Australia.
Margaret Hanna, of Waterbury, Conn., now Mrs. Margaret H. Coe, Naugatuck, Conn.
Velvys M. Heskiss, of Fairfield, Conn., now Mrs. Velvys H. Clark, Mansfield Center, Conn.
Carol Hock, of West Haverstraw, N. Y., to Floyd P. Smith, West Haven, Conn.
Louise V. Hutchinson, of Easton, Pa., to Malcolm R. Shaffer, Easton.
Beverly Israel, of Worcester, Mass., to Donald Jacobson, Bronx, N. Y.
Joyce Klukowski, of Grand Rapids, Mich., to Robert G. Poterack, Grand Rapids.
Sachiko Kuratimi, of Los Angeles, Calif., now Mrs. Sachiko K. Taniguchi, Los Angeles.
Elizabeth Ludemann, of San Jose, Calif., to J. T. Burridge, Oakland, Calif.
Nedra M. Ott, of Chicago, Ill., to Roy W. Lindquist, Des Plaines, Ill.
Joan L. Peck, of Johnstown, Pa., to William Markel, Johnstown.
Elizabeth J. Peirce, of Richmond, Va., now Mrs. Elizabeth P. Stewart, Richmond.
Inez Pereira, of North Providence, R. I., now Mrs. Inez P. McLaughlin, Providence, R. I.
Ann Richards, of Philadelphia, Pa., now Mrs. Ann R. Wedemeyer, Jamaica, N. Y.
Patricia A. Smith, of Hutchinson, Kans., now Mrs. Patricia S. Serpan, Lawton, Okla.
Gladys Takatani, of Oakland, Calif., now Mrs. Gladys T. Salzman, San Jose, Calif.
Margaret A. Upstill, of Cleveland, Ohio, to John P. Spindler, Branchville, N. J.
Patricia A. VanLanen, of Winter Park, Fla., to Daniel G. Hausner, Milwaukee, Wis.
Irene Wilson, of Englewood, Colo., now Mrs. Irene W. Snider, LaJunta, Colo.

Members' Publications

Miriam J. Partridge, L. A. Geddes, and H. E. Hoff are co-authors of an article entitled "An EKG Lead for Exercising Subjects," published in the *Journal of Applied Physiology*, March 1960.

Gwendolyn E. Turner, an assistant supervisor with the Visiting Nurse Association, Brooklyn, N. Y., is author of "The Cerebral Vascular Accident Patient," published in *Nursing Outlook*, June 1960.

New Student Members

College of Medical Evangelists
Jo Ann West

Stanford University
Paul Wild

United States Army—MFSS
Deonne Parker

University of Puerto Rico

Carmen Contreras	Eva Perez-Rodriguez
Betty Debien-Acosta	Maria Santiago-Santos
Zoraida Marrere-Alvarez	Eneida Seijo-Rivera

Graciela Velazquez-Martinez

University of Wisconsin
Sharon L. Meyers

Letter to the Editor

Dear Editor:

I am a student in Physical Therapy at the University of Michigan. Currently I am affiliating at Henry Ford Hospital in Detroit. As one of my assignments, I was recently asked to plan a program for an adult with cerebral palsy. In an attempt to gather all the information possible, I spent several hours in the library searching for articles on the subject. I was dismayed by the lack of discussion of the adult cerebral palsy victim. There was very little material available on any aspect of his treatment—goals, philosophy, technics, and so forth. I planned the program with the help of several in our department who have worked with such patients; though I certainly could have benefited greatly from the ideas of others who might be more experienced. I wonder if the adult cerebral palsy victim and his treatment might be suggested as topic material for future articles in the *Physical Therapy Review?* Other therapists have mentioned the increasing number of such patients, and it seems that all might benefit from a sharing of experience.

May I say how very valuable the *Review* has been to me during my first experience in practical application of physical therapy. It is such a good source of ideas.

Please change my mailing address to the above, after the June issue. Thank you for your time and consideration. I know that when I start actual practice in September, the *Review* will be of even more value.

Sincerely yours,

BARBARA CHRISTIANSEN
2517 North Haven Boulevard
Cuyahoga Falls, Ohio

EDITOR'S NOTE: This plea from a student should inspire those who have worked with adult cerebral palsy patients to submit case reports on this subject.

Chapter News

Kentucky

On May 14, 1960, the Chapter, in a joint meeting with occupational therapists, held their second annual seminar. The speakers in the morning session discussed "Theory of Administration and Supervision," and "Human Relations in Administration." The highlight of the afternoon was the discussion of cerebral vascular accident (CVA) treatment from the neurologic and neurosurgical aspects.

A two-page newsletter, the first for the Chapter, contained diversified information on: a resumé of two meetings, an introduction of the new Chapter President, notes of National news, and an announcement of a future meeting.

New Jersey

Volume 1, No. 3, newsletter reports that the Chapter President has attended some of her state's preparatory meetings for the White House Conference on Aging. Another newsletter item concerns the May 19-21 Essex County Health Fair at which five members attended the Chapter's booth and demonstrated a whirlpool treatment.

Texas—West Texas District

The July 30 meeting announced by the District had a threefold purpose: a Chapter Executive Committee meeting, a District program on "Problems," and a play day for all members.

West Virginia

The speaker for the July Chapter meeting was the State's Attorney General. His subject was "Process of Law."

Michigan—Eastern District

As a part of the May meeting, demonstrations were given of: a prosthetic device-patellar bearing cuff suspension BK; new functional splints; and an artificial muscle.

Minnesota

A brief note in the April "Spark Gap": Rummage Sale . . . Moderate supply of rummage—plus—adequate help—plus—a pleasant time . . . totaled $60.00 net.

New York—Hudson Valley District

"The Physical Therapist Role in Civil Defense" was presented by a field representative of the New York State Department of Civil Defense at the May meeting.

The "Valley Views" also reports that a display booth, a demonstration of equipment, and the showing of "The Return" were included in a health-career day at a local high school.

Vermont

Announcement of the tentative program for the July meeting, in place of a midwinter date, is made in the April-May newsletter.

Iowa

October 14-15 has been announced as the date for the Chapter's 1960 Fall Seminar in Iowa City.

Marian Swezey died on October 2, 1959, at her home in Ogden Dunes, Indiana, according to word recently received in the National Office. A graduate of the University of Nebraska, Miss Swezey was in the first class of Reconstruction Aides in Physiotherapy at Reed College in 1918. Following her military service she established a physical therapy department for industrial patients connected with the U. S. Steel Corporation in Gary, Indiana, where she remained until her retirement in 1956. Miss Swezey, a member of the first Executive Committee of the Association, was very active in the organization and early growth period of the Association. She served repeatedly on the Executive Committee and other national committees. She was the force in organizing the participation of physical therapists in the Tri-State Hospital Assembly meetings in Chicago. Those who knew her and worked with her in those days remember her as a "character such as one is seldom privileged to know—one in a lifetime—fun loving, nature loving, kind and generous as a friend."

Anna F. Lundberg Hopkins, Willows, California, passed away July 29, 1959, according to word received recently. Mrs. Hopkins received her physical therapy education at Stanford University in 1937. She was an active member in the Association from 1939 to 1941 and an inactive member from 1941 until her death. Mrs. Hopkins held membership in the Northern California Chapter.

Florida

The Chapter's Spring meeting, May 13-14, was held in Winter Park in conjunction with the Florida Society for Crippled Children and Adults.

The newsletter reports the Treasurer's statement of major Chapter expenses for the past five years within five categories: printing, postage, supplies, legislative expense, and miscellaneous.

Florida—West Coast District

The May "West Coast P. T. News" contained the annual reports of the three District officers and three committee chairmen.

Ohio

The May "Physioscope" highlights eight segments of the Chapter's annual meeting: cinearthrography of the hip joint; management of low back disorders; a panel discussion; medical progress in Russia today; Geophysical Year—South Polar Expedition; realistic goals in multipersonnel cooperation; endovirus research project; E.M.G. and movie research findings on moving hand function; and a film "Able to Live Again."

September Examination in Virginia

The next examination for physical therapists will be held on Monday, September 12, 1960 at 8:00 A.M., at the Medical College of Virginia, School of Physical Therapy, Memorial Hall (third floor), Richmond.

Virginia Physical Therapy Practice Act Amended

Section 54-273 of the Code of Virginia has been amended to remove limitation of the use of "massages, steam baths, dry heat rooms, infrared heat or ultra violet lamps in health clubs and spas, public or private." The fee for examination of physical therapists has been changed from $20.00 to $30.00; the $30.00 fee for reciprocity remains the same.

Information for Contributors

The Physical Therapy Review welcomes original articles of interest to physical therapists throughout the world. Prompt reviewing and processing of papers will be assured if attention is given to the following suggestions.

Manuscripts are accepted with the understanding that they have not been published elsewhere. Contributions may be classified as "Feature Articles," "Suggestions from the Field," or "Case Reports." Feature articles are longer and deal rather extensively with the subject presented; suggestions from the field are brief and describe the instrument or device presented; case reports are short and concerned with discussion of a treatment for a specific type of disease or disability. All material should be presented in a clear, logical, and impersonal discourse.

Submit the original *manuscript* and one carbon copy (keep one carbon copy for your files). All written material should be typed, double-spaced with minimum margins of 1 inch on 8½ x 11 inch opaque white paper. Legends for illustrations, tables, references, and acknowledgments should be placed each on a separate sheet. When citing another author's work, a superscript numeral must appear in the body of the manuscript. The *references* must be accurate and numbered in the order in which they appear in the text. Include the name of each author, title of the article, name of periodical, volume number, inclusive pages, and date.

Illustrations should be protected by cardboard and the name of author and figure number written with soft pencil on the back. If *photographs* are used, sharp black and white prints on glossy paper are required, avoid distracting backgrounds. Graphs, charts, and line figures drawn with india ink on heavy white paper are necessary for good reproductions. Letters and figures should be large enough so that they will be readable when reduced for publication. Tables are reproduced more legibly when the carbon is reversed and typing occurs on both sides of the paper.

Address manuscripts to:

PHYSICAL THERAPY REVIEW
1790 Broadway—Room 310
New York 19, New York

Education

The Value of Experience

Mary E. Callahan, A.M.*

You, who are entering the professional world as physical therapists, are asking: *What next?*

You know the answer: *Experience!*—not after you have captured another degree; nor after you have taken a specialized course in some aspect of physical therapy, but *now*—the sooner the better.

No one doubts the need for more education in so far as more knowledge becomes available. Yet a disturbing observation is that as the interest in academic degrees and postgraduate courses increases, there is a corresponding decrease in respect for the value of experience as a prerequisite.

The seasoned graduates of our profession who have been active in physical therapy know that they have something to give their patients which the inexperienced physical therapist does not have. The patients should not be deprived of this skill; and the opportunity to bring it to them should not be denied. Likewise, you as new graduates should not deny yourselves the opportunity of rounding out your professional education. We might go so far as to say you ought not to stunt the growth and development of something that has been so carefully prepared and which is now about to flourish.

Unfortunately, too many believe that an additional academic degree or postgraduate course automatically endows the bearer with the ability to handle any situation, no matter how thin his or her actual experience has been. Additional diplomas, certificates, etc., are not substitutes for experience and, conversely, experience is not a substitute for them. Each has a place that must be respected.

Having successfully completed your studies in physical therapy, you should have acquired a considerable body of knowledge of the scientific facts and principles upon which methods and procedures in physical therapy are based. Too, you should have been indoctrinated in the codes of conduct of your professional group. These should be acquired as a basis for perfecting your judgment, skills, attitudes and habits of work in your career as a graduate physical therapist. Facts, principles, skills, and work habits alone, however, are not adequate equipment for solving problems in your professional world.

Facts and principles may be quickly learned by relatively simple mental exertion, in many cases. However, most experts feel that full understanding of meanings will develop slowly and only through experience. Facts and principles may be used repeatedly in thinking, reasoning, and in making judgments so that they may become part of your structure of thought and thereby be available for subsequent use in solving professional problems.

You must develop an understanding of the scientific facts and principles underlying physical therapy; increase your knowledge of people and their reactions to illness, pain and deformity; learn to handle injured limbs skilfully; and finally develop skill in the performance of your work, which reflects an art and confidence, learned only through continuous practice and experience.

Only when these essential abilities articulate and function simultaneuosly, and with unity of purpose, can your practice of physical therapy be of a professional nature.

It takes time to accumulate experience, but always remember: *it takes time to build anything worthwhile.* Experience is a good teacher and with it comes growth and development. You are then able to enter the numerous gateways to further education because you are seasoned and professionally mature.

* Associate Professor and Director, Courses in Physical Therapy, Columbia University, New York, N.Y.

Student Column

Duke University

In observance of NATIONAL HOSPITAL WEEK and its theme for 1960, "Careers that Count," Duke University physical therapy students participated in the planning and carrying out of a Health Career day. Working with the physical therapy students were student representatives of the Schools of Medicine, Nursing, Dietetics, Administration, Medical Technology, and X-ray Technology. A panel of these students appeared on television to answer questions regarding their respective professions put forth by high school students interested in health-related professions.

Area high school students were invited to an open house which featured a tour of the hospital

and its teaching departments. Students interested in physical therapy were given information and shown the AMERICAN PHYSICAL THERAPY ASSOCIATION film, "The Return."

The program was extremely successful in its efforts to acquaint students with some of the many health career opportunities in hospitals and related institutions. Recommendations were made for the repetition of the program next year. Based on the experience gained this year, next year's event should be even more successful.

One of the greatest gains was the pleasure the students had in working together and becoming better acquainted with other professions in the Medical Center.

Schools Offering Courses in Physical Therapy

The listing of undergraduate programs which has appeared monthly in the *Review* will now be published four times a year in the March, June, September, and December issues. The listing last appeared in the March issue and will be published next in the June issue. Each month the issue in which the listing was most recently published will be identified in the Table of Contents under Regular Features.

Guide to Graduate Education

A list of suggested areas of graduate study and some universities offering this work, first published in the April 1960 *Review*, will hereafter appear four times annually in the issues of January, April, July and October. The listing and date of its most recent publication will be identified each month in the Table of Contents under Regular Features.

Films of Interest

CHILD PROSTHETICS PROJECT: A REPORT—22 min., b/w, sd. Rental. Inquire nearest film library or Department of Visual Communication, University Extension, University of California, Los Angeles 24, California. This film reports on the activities of the prosthetic team and demonstrates how the team integrates the disciplines involved in amputee research at U.C.L.A.

WHEELCHAIR SCHOLARS—10 min., b/w. Rental. Nearest film library or Department of Visual Communication, University Extension, University of California, Los Angeles 24, California. A documentary showing how the physical and academic facilities of a large university (U.C.L.A.) are adapted to the needs of wheelchair students.

STRESS AND THE ADAPTATION SYNDROME—35 min., color. Free. Pfizer Medical Film Library, 267 W. 25 Street, New York 1, N.Y. Presents the concept of stress as developed by Dr. Hans Selye by recapitulating the original experiments and intrepretation. Development of adaptation syndrome is graphically illustrated. Discusses application of findings to clinical medicine.

STILL GOING PLACES: ACTIVE MANAGEMENT OF DISABILITY IN THE AGED—40 min., b/w. Free. Pfizer Medical Film Library, 267 W. 25 Street, New York 1, N.Y. Demonstrates practical ways in which chronically ill or acutely disabled patients of advanced years can be helped to live useful, self-sufficient lives.

PROBLEMS OF THE MIND IN LATER LIFE—33 min., b/w, sd. Wm. S. Merrell Company, Medical Audio Visual Department, Cincinnati 15, Ohio. A documentary film of the 1956 Merrell symposium on Constructive Medicine in Aging. Flash-back technique brings out ideas of the various speakers.

A PLACE TO LIVE—24 min., b/w, sd. Wm. S. Merrell Company, Medical Audio Visual Department, Cincinnati 15, Ohio. A winner at the Edinburgh Film Festival, this film honestly portrays some of the problems of old age and moves toward a possible solution: a home for the aged.

A TWO-YEAR-OLD GOES TO HOSPITAL—50 min., b/w, sd., 1952. Rental. New York University Film Library, 26 Washington Place, New York 3, N.Y. A 2-year-old girl's reactions to an 8-day stay in the hospital and some of the effects of her temporary separation from her parents are shown in this film produced at Tavistock Clinic, London. The English hospital procedures depicted differ from those in our hospitals.

CEREBRAL VASCULAR DISEASES: THE CHALLENGE OF MANAGEMENT—38 min., b/w, sd. Rental: 1 day, $5.00; 2 days, $7.50. American Heart Association Film Library, 267 W. 25 Street, New York 1, N.Y. Concepts and techniques basic to the management of persons who have suffered cerebral vascular accident.

BACK ON THE JOB—16 min., b/w, sd. Rental: 1 day, $3.50; 2 days, $5.00. American Heart Association Film Library, 267 W. 25 Street, New York 1, N.Y. Shows steps taken by a cardiac work evaluation unit in returning a middle-aged cardiac patient to his former job.

EMBRYOLOGY OF HUMAN BEHAVIOR—28 min., color, sd. Rental. International Film Bureau, 57 East Jackson Boulevard, Chicago 4, Illinois. Produced by the Medical Audio-Visual Institute of the Association of American Medical Colleges in cooperation with Dr. Arnold Gesell, this film traces the stages of development of eye-hand coordination in infants. 1951.

KNEE ARTHROTOMY—30 min., b/w, sd. Free. Winthrop Laboratories Motion Picture Division, 1450 Broadway, New York 18, N.Y. This film is one of a series produced to serve as training aids for surgical residents. Knee anatomy, surgical technique, and rehabilitation with graded resistance exercise are shown in detail.

HOW TO CONDUCT A DISCUSSION—25 min., b/w, sd., 1953. The ANA-NLN Film Library, 267 W. 25 Street, New York 1, N.Y. States eleven principles important to consider in leading a discussion. Each is demonstrated. Designed to help chairmen insure effective and satisfying group discussions.

SHORT TERM COURSES FOR GRADUATE PHYSICAL THERAPISTS

Title of Course	*Sponsor of Course*	*For Details Contact*	*Dates of Course*
Cerebral Palsy	The North Carolina Cerebral Palsy Hospital Durham, North Carolina	Dr. Lenox D. Baker Medical Director No. Carolina C. P. Hosp. Durham, North Carolina	Courses arranged according to individual need—duration 3 months
Physical Therapy in the Care of Neuromuscular Disease	Georgia Warm Springs Foundation Warm Springs, Georgia	Robert L. Bennett, M.D. Medical Director Ga. Warm Springs Found. Warm Springs, Georgia	January April October
Technics of Neuromuscular Reeducation	California Rehabilitation Center Vallejo, California	Margaret Knott, Chief P.T. Calif. Rehab. Center Vallejo, Calif.	January 1 April 1 July 1 October 1
International Postgraduate Cerebral Palsy Course	International Society for Welfare of Cripples and United Cerebral Palsy, Inc.	Dr. Isabel P. Robinault Institute for the Crippled and Disabled 400 First Avenue New York 10, New York	Sept. 6—23, 1960
Below-Knee Prosthetics	U. of California and U.S. Office of Vocational Rehabilitation	Dr. Miles H. Anderson, Director, Prosthetics Education Program— University of California Los Angeles 24, Calif.	Sept. 19—23, 1960 Oct. 31—Nov. 4, 1960 Dec. 12—16, 1960 Jan. 23—27, 1961
Advanced Physical Rehabilitation Methods for Physical/Occupational Therapists	New York University Medical Center—Institute of Physical Medicine and Rehabilitation (in cooperation with New York University School of Education)	Mrs. Edith Bauchwald Lawton, Director, Postgraduate Education for Paramedical Personnel, New York University Medical Center, Institute of Physical Medicine and Rehabilitation, 400 East 34 Street New York 16, N. Y.	Nov. 14—Dec. 9, 1960 Jan. 30—Feb. 24, 1961 Apr. 24—May 19, 1961
Treatment for the Cerebral Palsied	Children's Rehabilitation Institute for Cerebral Palsy Reisterstown, Maryland	Christopher H. Wiemer Executive Director Children's Rehab. Inst. Reisterstown, Maryland	Oct. 3—Dec. 16, 1960 Jan. 2—Mar. 17, 1961 April 3—June 16, 1961 July 3—Sept. 15, 1961 Oct. 2—Dec. 15, 1961

Coming Meetings

Aug. 29—Sept. 1 American Hospital Association, Civic Center, San Francisco

Sept. 11—15 International College of Surgeons, 12th Congress, New York City

Don't Fail . . . . .

To notify the *Review* when you leave school for clinical practice, go home for a vacation, or take a new position.

If you have not decided upon your new location, write and ask that your *Reviews* be held until you can furnish an exact address—which includes *postal zone number!*

Physical Therapy Review
1790 Broadway, Room 310
New York 19, N. Y.

Guide To Graduate Education

Any physical therapist contemplating a program of advanced study is encouraged to inquire of several colleges or universities in order to find a program compatible with his interests and needs.

A wide variety of programs is available throughout the United States and Puerto Rico. The following list is indicative only of some opportunities in the universities which offer approved courses in physical therapy.

Some areas of major study on masters/doctoral level	*Location of course*	*For information/bulletin, contact:*
2-10	College of Medical Evangelists Loma Linda, Calif.	Keld J. Reynolds, Ph.D. School of Grad. Studies
1-2-3-4-5-7-9-10-11-12	Stanford University Palo Alto, Calif.	Rixford K. Snyder Director of Admissions
8	Division of Physical Therapy Stanford Med. Center	Marian Williams, Ph.D.
2-5-9-10-11	Grad. Div., Northern Section U. of Calif., Berkeley 4	Dean of Graduate Division
	U. of So. Calif., Los Angeles 7	
1-2-5-6-10-11-12	Graduate School	Milton Kloetzel, Dean
8	P. T. Department	Margaret S. Rood
	University of Colorado	
2	Medical Center, Denver 20	A. R. Buchanan, M.D.
8		Dorothy Hoag
10		C. A. Maaske, Ph.D.
5-9-11	Graduate School, Boulder	Office of Admissions
1B-5-9-11-12	U. of Conn., Storrs	N. L. Whetten, Ph.D. Dean, Graduate School
1A-2-3-5-6-8-9-10-11-12	Grad. Sch., Northwestern U. Evanston, Ill.	Mrs. Janet L. Green Secretary for Admissions
	Indiana University	
9-11	Grad. School, Bloomington	J. W. Ashton, Ph.D., Dean
4-5	Sch. of Ed., Graduate Div. Bloomington,	H. T. Batchelder, Ph.D. Associate Dean
2-10	Sch. of Med., Indianapolis	John Van Nuys, M.D., Dean
2-5-9-10-11-12	*State U. of Iowa, Iowa City	W. F. Loehing, Dean, Grad. Coll.
8	Children's Hosp.	Wm. D. Paul, M.D.
2-4-5-9-10-11	University of Kansas Lawrence	John H. Nelson, Ph.D. Dean, Graduate School
	University of Maryland	
1-3-5-6-7-9-11-12	Graduate School, College Park	For either: Ronald Bamford Ph.D.
2-10	Sch. of Med., Baltimore 1	Dean, Graduate School
	Boston U., Boston, Mass.	
1-2	Graduate School	Edward K. Graham, Dean
5-6	School of Education	Donald Hayes, Registrar
1-2-3-5-9-10-11-12	University of Michigan Ann Arbor	Admissions Office, Horace H. Rackham, Sch. of Grad. Studies

1—Administration
1A—Hosp. Administration
1B—Bus. Administration
2—Anatomy
3—Chemistry
4—Education including Guidance & Counseling
5—Education
6—Guidance & Counseling
7—Human Relations
8—Physical Therapy
9—Physics
10—Physiology
11—Psychology
12—Others

* Partial credit of basic Physical Therapy program towards masters degree *if* student meets Graduate School requirements.

Some areas of major study on masters/doctoral level	*Location of course*	*For information/bulletin, contact:*
1-2-3-5-6-9-10-11 8	The Graduate School U. of Minnesota, Minneapolis	Theodore C. Blegen, Dean Mrs. Ruby M. Overmann
1A-5-9-10-11	St. Louis University St. Louis, Mo.	Robert J. Henle, S.J., Ph.D. Dean, Graduate School
1A-1B-2-3-4-5-6-9-10-11-12	Washington University St. Louis 30, Mo.	Lewis E. Hahn, Ph.D., Dean Graduate Sch., Arts & Sciences
2-3-9-10-11-12	Columbia U. New York 27 Faculty of Pure Science Morningside Heights	Prof. Marshall Kaye
1-5-6-7-11-12	Teachers' College 525 W. 120 St. New York 27	Admissions Office 525 W. 120 St. NY 27, NY
	*New York U., New York 3	
2-9-10-11-12 1-5-6-7-8-11-12	Grad. Sch., Arts & Sciences School of Education	Office of Admissions Office of Admissions
	U. of Buffalo, Buffalo 14, N.Y.	
2-9-10-11 1-5-6-12	Grad. Sch., Arts & Sciences School of Education	H. M. Woodburn, Dean Robert S. Fisk, Dean
1A-2-3-5-9-10-11-12	*Duke University, Durham, N.C.	Dean of Graduate School
1B-2-3-4-5-9-10-11-12	Grad. Sch., U. of N. Carolina Chapel Hill	George A. Heard, Ph.D. Dean
1-2-3-5-6-9-10-11-12	Grad. Sch., Ohio State U. Columbus 10	Dean of Graduate School
	University of Oklahoma	
3-4-5-9-11-12 2-10-12	Graduate College, Norman Medical Center, Okla. City	For either: Dean of Grad. Coll., U. of Okla., Norman
2-4-5-7-9-10-11-12	U. of Pennsylvania, Phila. 4	Grad. Sch., Arts & Sciences
2-3-10-12 2-3-10-12	Baylor U. Med. Center, Dallas, Tex. Grad. Resch. Inst., Dallas, Texas	For either: Div. of Grad. Sch. Baylor U., Waco, Tex.
2-10	U. of Texas—Medical Branch Galveston	Donald Duncan, Ph.D. Assoc. Dean of Graduate School
2-10	Medical College of Virginia Richmond 19	Ebbe Hoff, Dean Sch. of Grad. Studies
	Marquette U., Milwaukee 3, Wis.	
2-5-9-10-12 8	Graduate School PT Curriculum, Sch. of Med.	Lawrence W. Friedrich, S. J. Dean Beth Phillips, Director
1-2-3-4-5-7-8-9-10-11-12	Graduate Sch., U. of Wisconsin Madison 6	Dean, Graduate School 150 Bascom Hall

1—Administration
1A—Hosp. Administration
1B—Bus. Administration
2—Anatomy
3—Chemistry
4—Education including Guidance & Counseling
5—Education
6—Guidance & Counseling
7—Human Relations
8—Physical Therapy
9—Physics
10—Physiology
11—Psychology
12—Others

* Partial credit of basic Physical Therapy program towards masters degree *if* student meets Graduate School requirements.

Schools Offering Courses in Physical Therapy

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Schools offering the four year program leading to a baccalaureate degree accept high school graduates and transfer students. Schools offering the 12 to 16 months' program leading to a certificate accept students who have completed all or most of their undergraduate work providing they meet certain course requirements. Recipients of a degree and/or certificate have equal professional status. For specific information regarding each school's entrance requirements, curriculum, tuition and other fees, write to the physical therapy director indicated below. All students should investigate course requirements *early*.

	Degree	*Certificate*
CALIFORNIA		
Mary J. Dodge School of Physical Therapy Childrens Hospital Society 4614 Sunset Boulevard Los Angeles 27	‡	†
Ronald A. Hershey School of Physical Therapy College of Medical Evangelists Loma Linda	†	†
Lucille Daniels Division of Physical Therapy School of Medicine Stanford University Stanford (Palo Alto)	†	†
Margery L. Wagner Curriculum in Physical Therapy University of California The Medical Center San Francisco 22	†	†
Margaret S. Rood Department of Physical Therapy University of Southern California Los Angeles 7	†	†
COLORADO		
Dorothy Hoag Curriculum in Physical Therapy University of Colorado Medical School Denver 20	†	†
CONNECTICUT		
Frances M. Tappan School of Physical Therapy U 101 University of Connecticut Storrs	†	
ILLINOIS		
Elizabeth C. Wood Course in Physical Therapy Northwestern University Medical School 303 East Chicago Avenue Chicago 11	†	†
INDIANA		
Frances C. Ekstam Physical Therapy Program School of Medicine Indiana University Medical Center Indianapolis 7	†	
IOWA		
Olive C. Farr Physical Therapy State University of Iowa Hospitals Iowa City		†
KANSAS		
Ruth G. Monteith Section of Physical Therapy Education University of Kansas Medical Center Kansas City 12	†	†
MARYLAND		
Gladys E. Wadsworth, Ph.D. Department of Physical Therapy School of Medicine University of Maryland Baltimore 1	†	
MASSACHUSETTS		
Adelaide L. McGarrett Physical Therapy Department Boston University Sargent College University Road Boston 15	†	†
Constance K. Greene Department of Physical Therapy *Bouvé-Boston School, Tufts University Medford 55	†	
Shirley M. Cogland *Program in Physical Therapy Simmons College The Fenway Boston 15	†	†
MICHIGAN		
Virginia Wilson Curriculum in Physical Therapy The University of Michigan University Hospital Ann Arbor	†	†
MINNESOTA		
Dale V. Shaffer School of Physical Therapy Mayo Clinic Rochester	‡	†
Wilbur L. Moen Course in Physical Therapy University of Minnesota 860 Mayo Memorial Building Minneapolis 14	†	

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

	Degree	Certificate
MISSOURI		
Sr. M. Imelda, S.S.M. Department of Physical Therapy St. Louis University 1325 South Grand Boulevard St. Louis 4	†	
Beatrice F. Schulz Department of Physical Therapy Washington University School of Medicine 660 So. Kingshighway St. Louis 10	†	
NEW YORK		
Dorothy L. McLaughlin Russell Sage College-Albany Medical College Division of Physical Therapy Albany 8	†	†
Mary E. Callahan Courses for Physical Therapists Columbia University College of Physicians & Surgeons 630 West 168th Street New York 32	†	†
Elizabeth C. Addoms Physical Therapy Curriculum School of Education, New York University Washington Square East New York 3	†	†
Mildred F. Heap Program in Physical Therapy University of Buffalo 3435 Main Street Buffalo 14	†	†
NORTH CAROLINA		
Helen Kaiser Division of Physical Therapy Box 3247, Duke University Medical Center Durham		†
Margaret L. Moore Section of Physical Therapy School of Medicine University of North Carolina Chapel Hill	†	
OHIO		
Robert D. Kruse, D.P.E. Course in Physical Therapy Frank E. Bunts Educational Institute 2020 East 93rd Street Cleveland 6	‡	†
Gladys G. Woods Curriculum of Physical Therapy Ohio State University University Hospital Columbus	†	†

	Degree	Certificate
OKLAHOMA		
Thelma Pedersen School of Physical Therapy University of Oklahoma, Medical Center Oklahoma City 4	†	†
PENNSYLVANIA		
Dorothy E. Baethke Division of Physical Therapy University of Pennsylvania 3901 Pine Street Philadelphia 4	†	†
Kathryn Kelley Division of Physical Therapy D. T. Watson School of Physiatrics Leetsdale	‡	†
PUERTO RICO		
(All classes given in Spanish) Lutgarda V. Piñeiro School of Physical & Occupational Therapy Candelaria & Mandry Streets Stop 22, Santurce	†	†
TEXAS		
Doris E. Porter Grady Vaughn School of Physical Therapy Baylor University Medical Center Dallas 10	†	†
Cecelia J. Lee School of Physical Therapy Hermann Hospital Houston 25	‡	†
Ruby Decker School of Physical Therapy The University of Texas Medical Branch Galveston	†	†
VIRGINIA		
Susanne Hirt School of Physical Therapy Medical College of Virginia Richmond 19	†	
WISCONSIN		
Beth J. Phillips Curriculum in Physical Therapy Marquette University School of Medicine 561 North 15th Street Milwaukee 3	†	
Margaret Kohli Course in Physical Therapy University of Wisconsin Madison 6	†	
U. S. ARMY MEDICAL SERVICE		
*Physical Therapy Course Army Medical Service School Brooke Army Medical Center Fort Sam Houston, Texas Write to: The Surgeon General Department of the Army Washington 25, D. C. Att.: Personnel Division		†

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Abstracts

Multidisciplinary Studies of Illness in Aged Persons: III. Prognostic Indices in Fracture of the Hip

(Staff of the Benjamin Rose Hospital, Cleveland, Ohio), J. CHRONIC DIS., 11:445, April 1960

In continuing studies at the Benjamin Rose Hospital, data were accumulated concerning the course of chronic illnesses. Certain nursing, physical, and psychologic characteristics were prognostically related to mortality and to deterioration in activities of daily living. Increasing age correlated positively with deterioration in activities of daily living; mortality was also associated with the patients in the advanced age group (80 years and older). Patients who required relatively more nursing aid during the ninth and tenth weeks after fracture had a higher mortality rate and more frequent deterioration in activities of daily living than other groups. The proportion of deterioration was greater among those with congestive heart failure or myocardial infarction. Deterioration is also associated with patients achieving low intelligence quotients, and especially prominent among those with psychotic or aggressively hostile personality. The presence of prior disability, especially among the younger patients, was related to rheumatoid arthritis or stroke; frequency of deterioration was greater in patients with prior disabilities.

Efforts are being continued to define other primary disabilities associated with hip fracture. These are preliminary to defining groups of aged persons with increased susceptibility of hip fracture, and to initiating measures that would decrease the number of fractures and resultant chronic mobility limitation.

Repair of Tendon Injuries of the Hand

R. E. S. Young and J. M. Harmon (Columbus, Ohio), ANN. SURG. 151: 562, April 1960

The increasing frequency of industrial hand injuries, and the importance of hand function to the wage earner, make consideration of these problems important. Every incision and suture in the hand is accompanied by some loss of function. This is more notable in flexor than extensor tendon division. The failure of flexors to heal without residual stiffness is due to two factors: Adhesions between tendon and sheath occurring during relatively prolonged immobilization, and fusiform or bulbous growth of the tendon at the point of suture in response to poor tolerance of this tissue for the suture material.

Management of these patients has traditionally included use of wire or silk sutures, and postoperative immobilization for seven to twenty-one days. Use of immobilization is based on the known reduction in tensile strength of the tendons from three to seven days postoperatively, followed by gradual increase. The authors' management included use of #5-0 chromic catgut sutures, thought to be less irritating and more readily absorbed, though somewhat weaker, and encouragement of immediate postoperative mobilization of the finger. Early motion was thought to both help prevent adhesions and to reduce tension on the suture line by allowing the strain of muscle spasm to be dissipated through movement. A rubber band is attached from the wrist to a suture through the nail, which pulls the finger into partial flexion. From the first postoperative day the patient uses the other hand to extend the injured finger passively, gradually increasing to full motion at the end of three weeks. No active motion is permitted until that time when most patients show full active range. "Physiotherapy is rarely necessary." Operative procedures are described, and cases cited from a series of 242 patients.

External Splintage as a Cause of Movement in Fractures

J. H. Hicks (Birmingham Accident Hospital, Birmingham, England), LANCET, LOND., 1:667, March 26, 1960

It seems probable that small movements can occur at the fracture site inside conventional plaster casts. One purpose of this paper is to add weight to the suggestion that small movements are common in fractures treated conservatively. The second purpose is to show that external splintage properly applied may actually contribute to such movements.

To investigate the effectiveness of plaster in fixing a fractured tibia the following experiment was done on freshly amputated legs: A specimen with a comminuted fracture of the tibia was enclosed in a long plaster cast. The plaster was applied more tightly than would ever be risked in clinical practice. A small window was cut over the fracture site so that the behavior of the fracture ends could be observed. Using only such forces as could be applied by the fingers it was found that one fragment could be made to shift 2.5 cm. relative to the other. Twenty degrees of rotation and six degrees of angulation were easily obtained. Only when large movements were attempted was any appreciable resistance offered by the splintage. Movements of appreciable magnitude were observed by taking hold of the femur and using it to move the whole limb with its enclosing plaster. This would occur in real life if a patient were to alternate between standing up with the limb free and sitting down with the heel resting on the floor. The soft padding of subcutaneous tissue and muscle between the cast and the bone may explain the movement even though the cast is applied tightly.

The above movements are produced by more or less artificial forces. There are, however, natural forces arising from the patient's own muscle action. These forces may be redirected by external splintage inwards on the fracture site and thus cause movement. For example, if the forearm were fractured below the insertion of the biceps and the patient attempts to flex his elbow, the plaster on the forearm resists movement at the elbow joint. The pull of the biceps is then transferred to the proximal fragment and causes an angulating stress at the fracture site.

Surgeons and physiotherapists with their modern enthusiasm for early "exercises" encourage the very muscle contractions that can cause movement of a fracture in plaster.

External splintage has a definite positive action against forces from the outside such as gravity and external blows, but the forces coming from within must be kept in mind as a possible explanation for the misbehavior of certain fractures in practice. The invisible movement described in this paper may be responsible for joint stiffness which

is not due so much to immobilization of a joint but to failure of immobilization of the fracture.

It is probable that present treatment succeeds in indirect ways rather than by any direct splintage effect. It is the author's belief that, paradoxically, plasters that are too short or too loose, may result in less movement at the fracture site because they allow movement at the joint above or below the fracture. In addition, the patient may not contract his muscles in the early stages because of pain and thus avoids movement of the bone.

External splintage is effective only in so far as it prevents gross movement at a fracture site. It is very ineffective in preventing small movements. External splintage plus muscle contraction tend to cause movement at a fracture site. Many rules of splintage increase the likelihood of movement. Muscle "exercises" are one of the causative factors in such movement.

Rehabilitation in Rheumatoid Arthritis

William D. Paul (Division of Poliomyelitis and Rehabilitation, College of Medicine, State University of Iowa, Iowa City, Iowa), SOUTH. M. J., 53:492, April 1960

Rheumatoid arthritis is a generalized disease in which major histologic changes occur in synovia, in cartilage and other structures in and about the joints. To simplify treatment, the author presents a four-stage division of the disease: (1) the acute stage; (2) the stage of exacerbations and remissions; (3) the early stage of deformity; and (4) the ankylosing stage. Since there are no specific remedies that will cure or arrest the disease, treatment is directed toward: (1) suppression of acute flares; (2) maintenance of function; (3) reduction of pain; (4) prevention of marked muscle atrophy and shortening; and (5) the possibility of continuing the activities of daily living.

The basis of all treatment for rheumatoid arthritis is the maintenance of mobility through adequate motion and relief of pain by means of either simple analgesics or by physical therapy of the type that can be carried out at home. It is suggested that each patient be made acquainted with a few basic facts relative to his disease in order to dispel the fear of being bedridden or confined to a wheelchair. The author states that about 60 per cent of the cases will burn themselves out; 30 per cent have exacerbations and remissions with slight to moderate deformities; and that only 10 per cent may advance to severe deformities.

Pain is the most common and most distressing symptom. The drug of choice is acetylsalicylic acid, but when necessary corticoids are a valuable supplement. However, they should be used with caution.

Periods of rest should be prescribed to achieve optimum mobility in the arthritic patient. Various types of heat will help to maintain function and reduce pain. Exercises that can be carried out at home or place of employment will prevent marked deformities, marked ankylosis, some of the muscle atrophy, and will help to strengthen the muscles.

The author suggests that marked deformities of the hands and feet can be prevented by early surgical procedures.

What Is a Profession?

Editorial, INDUST. M. & S., 4:185, April 1960

A profession is any occupation (1) in which preparation is based on systematic instruction, (2) in which requirements exist for the use of the intellect rather than solely experience and (3) in which material returns are not the overriding characteristic.

A number of scientific groups are wallowing in debate as to whether or not they are in a profession. The answer is simple. No declaration, no bylaw enactment, and no governmental or other occupation classification will determine whether a group constitutes a profession. The determinant will be the group itself, its qualifications, its requirements for the application of the intellect, and the significance attached to material returns as the essence of the occupation.

Many generations ago tradition dictated that medicine, theology, and law constituted the three learned professions. Although it might be less difficult to unscramble eggs than to overthrow tradition, there may be a just need to enlarge the category of learned professions. Written only faintly is the admission (at the present time) that several of the professions have requirements as to proficiency in excess of those who now occupy the top drawer.

In the "new and enlarged" learned professions might appear astronomy, physics, chemistry, and some engineering. If industrial hygiene continues its brilliant exploits and abandons its gnashing of teeth, it may yet be included in the above group. The best augury of a man's success in his profession is that he thinks it the finest in the world.

Functional Restoration of the Patient at Home

Jose C. Montero and Dorothy Rosenberg (May T. Morrison Center for Rehabilitation, San Francisco, California), J. AM. M. ASS., 172:1897, April 23, 1960

Provision of a home program of rehabilitation can be of great benefit, particularly for the chronically ill or disabled patient. The home situation is often quite different from the hospital area in which functional activities are practiced. Discharge from the hospital often precedes full training in these skills. The family often needs continued guidance in helping the patient meet problems at home; and the patient, who in the hospital, has been only one of many disabled persons, may have emotional difficulties in integrating himself with the family when he is the only handicapped member.

Solution of these problems through home rehabilitation services includes work in several areas. Evaluation of the patient must be made in terms of his abilities as they relate to his individual home environment. Evaluation of the home and suggested modifications may include major constructural changes and use of complex apparatus. In most cases however, it must be based on simple, inexpensive changes that will not alter resale value of the property. Such changes should allow increased independence and efficiency in functional activities for the patient and/or reduce the burden of care by the family of attendance.

A number of fine suggestions are made for patients in three general groups: those with lower extremity problems; those with upper extrem-

ity problems; and those requiring total care. Assistive devices, orthopedic appliances and special clothing are discussed, with the caution that the following questions must be asked before these are ordered: What function will be improved? Will the device limit any necessary functions? Can it be used easily in the patient's home? Is the cost within his means? Are repairs and replacement parts easily available; and, finally, does the patient want to accomplish the activity enough to invest the time, energy and money required to become proficient in its use? Further suggestions are made on work simplification and work-saving devices, and on the aims of exercise in such a program.

Peripheral Nerve Injury Associated with Fractures

Kemp Clark (University of Texas Southwestern Medical School, Dallas), POSTGRAD. M., 27:476, April 1960

The problem of combined injuries of the peripheral nerves and fractures of the long bones is covered from etiologic and pathogenic points of view. If the axon fiber is severed, the nerve fiber will undergo wallerian degeneration, characterized by loss of the axon fiber back to the nearest proximal node of Ranvier with breakdown of the myelin sheath. Development of collateral sprouting from the axon and the attempt of the fibrils to find the Schwann cell tube in the distal nerve trunk are the most pertinent parts of regeneration. Neurapraxia, axonotmesis, or neurotmesis may occur if the nerve is not completely severed, and may necessitate different treatment.

The most frequent combined injury of bone and peripheral nerve is a compound wound occurring from without inward. Prompt and adequate debridement is essential. Peripheral nerve injuries occurring in closed wounds result from stretch and such patients show dissociated loss. Prognosis of rate and time of recovery depends on thorough examination of motor and sensory loss, and determination of level of injury. Tinel's sign is not a reliable index of functional return because it does not indicate whether an adequate number of axon fibers are regenerating.

Delayed peripheral nerve injury may be associated with incorporation of the nerve in a scar or callus or with ischemia.

Paying for Rehabilitation

Dean W. Roberts and Basil J. F. Mott (National Society for Crippled Children and Adults, Inc., Chicago, Illinois), J. AM. M. ASS., 172:1934, April 23, 1960

In 1958 the House of Delegates of the American Medical Association endorsed a recommendation of its Rehabilitation Committee, urging that the medical profession take a direct interest in local rehabilitation services, by seeing that their patients were directed to the services as needed and by taking the initiative in establishing such facilities. The physician may have various responsibilities to such a center. In all cases he supports it as the prescribing physician for his patients who need rehabilitation services. He may also act as medical director, member of the advisory committee, or member of the board of directors. In addition, an active interest in the financial problems entailed in the provision of such services is necessary if they are to succeed.

At present, rehabilitation centers are of three types: privately operated, those that are a part of a hospital, and those that are state operated. Financial support is derived from private fees, donations, and payments from third party agencies, such as insurance companies that buy rehabilitation services for patients whom they cover. Ten centers were studied. Cost averaged $7.00 per visit (exclusive of physicians' fees) for outpatients, and $30.00 per day for inpatients. Centers caring for inpatients received one-fifth of their annual income from grants and donations, and the rest from payments of fees. Outpatient centers received three-fifths of their income from such subsidies and donations. The higher degree of self-support of inpatient centers was accounted for by the fact that most of their fees are paid by third parties, which now do much less to purchase outpatient rehabilitation services.

In order to meet the basic budget, the limitations and inefficiency of a continued need to recruit outside donations are stressed. A strong plea is made for an increase in third party coverage for both in and outpatient fees for rehabilitation services. Pre-payment insurance which currently provides little in this area is particularly suggested as a solution to this problem; and the medical profession is reminded of its responsibility in stimulating development of such programs.

Reflections on the Professional Education of the Physiotherapist. Sybil M. Evans, (Late Principal, School of Physiotherapy, Guy's Hospital, London, England), PHYSIOTHERAPY, 46: 95, April 1960

These "reflections"—stated largely in the form of questions—begin with a discussion of the non-professional requirements of training. Is this education adequate in three major areas? (1) Preparation for the rights and duties of membership in the professional association; (2) preparation for possible work abroad, often in less developed countries of the world; and (3) preparation for the responsibilities of citizenship.

Throughout his training the teacher has two major responsibilities: (1) Instruction in a subject-development of competency in the field; and (2) training the intelligence-development of the intellectual, critical, and emotional responses characteristic of an educated person. As one facet of the latter it is stated, "Any educated person should be able to think clearly and to express himself clearly in speech and writing. This would seem to imply some continuous concern with English."

Professional training as a whole is considered as to whether it is "sufficiently flexible to maintain close contact with new developments, and whether it is sufficiently challenging to produce physiotherapists with alert and critical minds, armoured against routine mediocrity, who would regard their profession as a constant process of learning and improvement. Emphasis is given to the importance of careful planning of post-registration courses, and to participation in professional society activity, so that they will help meet the needs of the recent graduate. The responsibility of the teacher throughout all phases of training is enormous. "A main function of the teacher is to encourage positive activity rather than passive reception, so that mental discipline comes by planning to do the right thing in

the right way." One year of academic study in the principles and practice of teaching is the minimum of preparation for this responsibility. The evaluation of the teaching program, through the standardized qualifying examination required of all students, is discussed with final reflections on the need for utilization of all forms of criticism of the program in planning its continued improvement.

The Patient's Motion Ability: Evaluation Methods, Trends, and Principles

Mary Eleanor Brown (Highland View Hospital, Cleveland, Ohio), REHAB. LIT., 21:46, February and March 1960

Part I (Feb.), includes four methods of evaluating patients: (1) Daily Activities, (2) Muscle Strength, (3) Range of Motion and (4) Work Potential.

1. Daily activities are defined as the everyday acts customarily performed in order to live and breathe, exclusive of other daily work activities, such as hobbies, housework, leisure-time activities, and jobs.

Many work-sheet forms for evaluating the patient's daily activities are assessed in which the profusion of ADL forms is said to have done so much to denude the subject of its vital content. Critics have questioned the validity of ADL forms and whether a patient's therapeutic success or status should be judged by his daily-activity achievements. The consensus of opinion, however, is in favor of a reliable and objective daily-activity test.

2. Muscle strength evaluation is discussed, laying stress on the pros and cons of manual versus nonmanual examination. The validity of the gravity factor is challenged in manual examination inasmuch as the author has noted in practice that, if resistance beyond the weight of the part is offered, a response can sometimes be felt in muscles that apparently do not become activated when called upon to lift that part. The results of muscle examination, as presently used, are not sufficiently repeatable to serve either as a research tool or as clinical documentation except that of the most subjective kind. The promotion and use of muscle "testing," in general, is out of proportion to its actual scientific and practical value.

3. Range of joint motion measurement serves as a basis for useful and simple exercise routine, and also provides practice for those learning and investigating the subject of kinesiology. It is suggested, again, that range of motion studies are as full of pitfalls as muscle testing and daily-activity rating. The indication for checking range of joint motion lies in the patient's actual need for it. And although not wholly scientific, range of motion measurement does serve as a subjective gauge.

4. In assessing the patient's work potential, three prevocational evaluation "systems" are briefly identified: the Veterans Administration Prevocational Evaluation; the Tower System developed at the Institute for the Crippled and Disabled; and the Highland Shop's Prevocational Evaluation in Chronic Disease. It is emphasized that the early education of crippled children should include a motor-work skill program, thus obviating many of the present overwhelming lacks in the cerebral palsied adults.

Part II continues with trends in evaluation. The growing custom of evaluating the patient's home at firsthand heads this list. The aim of professional evaluation of the home is to maintain whatever level of independence the patient can achieve. Guidance is then given to the patient, his family, and the community, in a joint effort to accomplish this aim. Second, is the evaluation of the total person. Four different patterns stand out as unified approaches to the overall evaluation of the patient. Third, is evaluation by disease entities and, fourth, is evaluation of physical fitness. Fifth, is evaluation of responses of groups of patients to specific therapy.

Twenty evaluation principles are listed as guides for developing an evaluative turn of mind. The paper is summarized by ten highlights. It also includes an excellent review of references grouped by subject.

Moderate Resistance Exercises

Jacob L. Rudd (Private practice, England) PHYSIOTHERAPY, LOND. 46:129-133, May 1960

Programs of graded, measured, heavy resistance usually employed in progressive resistance exercises, are felt to be unsuitable for use in private practice where there is neither time nor personnel for such detailed systems and where most patients are "not weight lifters." Moderate-Load and Moderate-Repetition Exercises are described in which the patient lifts a moderate weight a moderate number of times, stopping when "discomfort is detected." There is "no need for a time-consuming predetermination of the exact number of repetitions or the exact amount of weight that will be tolerated." The amount of weight to be lifted is "estimated," and the patient begins with from 6 to 20 lifts. He then rests for approximately two minutes or "until the muscles feel rested," and performs a second bout of lifts. After a second rest period he completes the day's exercises with a third bout of lifts. In each case repetitions are limited by comfort. Several case histories are quoted with charts showing load and repetition increases over a period of several months. This method is to be preferred for its simplicity and safety, the latter of special importance for the aged or ill patient. The increase in strength so achieved "appears to be sufficient for the patient's requirements of daily working and living." Questions and critical comments follow from Miss J. M. Piercy, author of an article on Progressive Resistance Exercise (PRE), previously published in *Physiotherapy*.

Abstracters for August

The Editorial Board of the *Physical Therapy Review* is indebted to the following Association members for assistance in the preparation of abstracts in this issue:

Rachel Adams
Joan R. Erback
Miriam Partridge
Nancy Watts

Book Reviews . . . . .

Clinical Orthopaedics #14: Recent Advances in Orthopaedic Surgery of Infancy and Childhood. Edited by Anthony F. DePalma. Guest Editor, Albert R. Ferguson. Cloth, illus., 193 pp. Philadelphia: J. B. Lippincott Co., 1959. $7.50.

The 14th number of this series is concerned primarily with recent advances in orthopedic surgery in infancy and childhood. Accompanying this major area are the usual two additional sections. The first deals with general orthopedics and the other with miscellaneous items.

Section One, devoted to recent advances in orthopedic surgery in infancy and childhood, contains several original articles of general interest to the physical therapist: the significance of the various progressive factors in orthopedic surgery, management of the juvenile amputee, including surgery, prosthetic implications and prescription—and finally cerebral palsy involving the upper extremity. Whereas other items in this section are concerned with surgical considerations, they are nonetheless quite informative though restricted in interest.

Section Two contains three articles of wide interest. The first considers the surgical endeavors in arthritis, and is an excellent summary of the various technics available for the surgical management of this condition. The second article presents the pathogenesis of lumbar disc lesions; and the third is an excellent summary of the entire problem, including diagnosis and treatment of the painful coccyx.

Section Three contains items of quite limited application and interest from the nonsurgical standpoint.

This edition remains in keeping with the excellent standards achieved by previous volumes. The illustrations accompanying the articles are of high quality, the format is excellent, and the references carefully selected to supplement the text.

As with previous volumes, however, the reviewer is left with the feeling that the present volume is not of sufficiently broad interest in its entirety to be of value to the physical therapist. The articles however, are of particular interest and readily recommended as a means of broadening the therapists' knowledge of these subjects. Individuals may find the other articles beneficial, depending upon special needs or interests.

Principles of Disability Evaluation. By Wilmer Cauthorn Smith, M.D., Chief Medical Advisor, Oregon State Industrial Accident Commission; Fellow, American Association for the Surgery of Trauma. Cloth, illus., 210 pp. Philadelphia: J. B. Lippincott Co., 1959. $7.00.

Principles of Disability Evaluation is an excellent example of a very carefully written, deeply analytical and, on the whole, objective book with a purpose, which may be described as educational, and in many ways "pioneering," or filling a need. It not only calls attention to the increasing importance of disability evaluation in an era of greater consciousness of public and private disability compensation, but it also attempts to deal with what the author describes as an appalling shortcoming of that branch of medical science which deals with the recognition and evaluation of disability. This is identified as the lack of any available presentation covering the basic definitions, tenets and principles that are absolutely essential to the proper exercise of this medical function. It is with the hope of making a start toward fulfillment of this need that the author offers this volume. He aims to present and elaborate the philosophy and logic which he states must necessarily underscore any rational understanding of disability.

The subject matter of this work falls into four primary divisions, preceded by a preface and concluded with a liberal reference index. The Introductory Section deals with the growing importance of disability evaluation and the attitude of the physician toward its various facets. A brief discussion is provided on the relationship between the physician and the prevailing compensation system, including both the legislative enactment and the administrative agency. This concludes with notes covering important aspects of the medical report and, finally, emphasizes certain important considerations that apply to medical testimony. Section Two is devoted to defining and elaborating the concept of medically ratable industrial disability, to the limitations of medical science in the field of disability evaluation, and to the characteristics and attributes of valid permanent industrial disability. Section Three deals with the etiologic relationships between injury and disability or disease. Section Four is concerned with the actual evaluation of industrial disability, including discussion of principles underlying a rational approach to such appraisal.

Principles of Disability Evaluation is printed in legible, easy-to-read type with well-defined subject sections. The language and style is appropriate to the technical nature of the subject matter, which is presented in a clear, cohesive and sequential manner.

The book may be considered somewhat "specialized" reading, with more interest for some professions than others. It should be of interest and assistance to all physicians in general, however, and especially to those dealing more directly with compensation cases, whether related to public or private disability insurance programs. The medico-legal aspects and fundamental principles which can be applied to a variety of evaluation situations should likewise be of interest—though perhaps to a lesser extent—to lawyers, adjudicators, and related personnel. However, the book's specific value to professional personnel in allied medical fields, such as physical and occupational therapy, would be largely a matter of individual interest, and therefore difficult to evaluate—though there is no question of the book's overall value, from the standpoint of stimulating a keener awareness of the type of logical thought processes and sound medical approaches applied to this interesting subject.

Principles of Disability Evaluation gives every indication of being a valuable contribution in an area which, in recent years, is commanding increasing interest and attention.

Aphasia Handbook for Adults and Children. By Aleen B. Agranowitz and Mildred R. McKeown. Paper, illus., 103 pp. Ann Arbor, Mich.: Edwards Bros., 1959. $3.25.

Aphasia Handbook for Adults and Children is a valuable contribution to the literature on speech rehabilitation. The authors have capably and skillfully applied their knowl-

edge of aphasia to useful ends. (1) The book fulfills a need for an organized body of practical materials with descriptive methods for language retraining based on experience with aphasic children and adults. (2) It is designed to help the family as well as professional persons understand the problems encountered in the retraining of aphasia. (3) It provides orientation of students in speech therapy and professional people working in related areas of special education and rehabilitation. (4) It presents materials and methods primarily for adults and children with aphasia; however, many of the technics are suited to the retraining of other types of speech-handicapped persons.

Part I deals with aphasia in adults. The authors present questions commonly asked about aphasia and the answers are direct and informative. Basic concepts are presented: (1) language retraining parallels somewhat the language development of the child; (2) areas of the brain with related language functions, according to Brodman; and (3) results of damage to these areas. The related emotional problems and what can be done about them are very ably presented.

The section on retraining emphasizes the importance of the evaluation of aphasic defects as a basis for determining therapeutic procedures. It is stated that most tests actually describe what the aphasic can do, and, consequently, the remaining functions are tested rather than the aphasic defects. Some testing procedures are described.

The section "Attitudes and Special Techniques Applicable in Retraining Aphasics" is especially helpful. The many practical suggestions for approaching the problems of the various types of aphasia provide the understanding for using the materials in the retraining section.

Group and individual therapy in conjunction with psychotherapy are emphasized as important factors in the aphasia program. The authors discuss the value of personalized knowledge of the patient as a basis for excellent therapy, and also the need for an awareness on the part of the patient and his position in relation to his environment.

As an essential part of the early stages of retraining, emphasis is placed on the use of recording equipment and recorded language of all types for auditory training, especially auditory perception and recognition which establishes and reenforces language patterns.

The *Handbook* for the most part is printed in two columns; the right-hand column contains the sample exercises; and directly opposite are remarks and suggestions for their use.

Materials and methods of retraining that constitute the remainder of the *Handbook* are designed to meet the needs of patients with specific language disorders caused by injury to certain areas of the brain. Each disorder, together with its appropriate title, is explained carefully. The section on materials deals with retraining in auditory perception, naming and formulation of concepts (oral and written), speech, reading, writing, spelling, and arithmetic. (An additional section on materials suggests plans for correlating speech drills, reading, writing, and singing.) The materials are organized to include beginning, intermediate, and advanced levels of retraining.

Part II is a direct and informative discussion of aphasia in children. It follows quite the same pattern as the first section, on adult aphasia. It sets forth the basic similarity and differences of aphasia in children and adults and explains why the differential diagnosis of aphasia in children presents a most difficult problem. Parent counseling, school placement, materials, general and specialized technics for training, and play therapy are included. The authors stress the importance of individual therapy (until the child shows progress and becomes more organized) before small group therapy is attempted. They insist that the aphasic child should have the experience of socialization in a school situation as part of his training.

Some of the materials for adults in the *Handbook* is the outgrowth and accumulation of experimenting and testing by a group of therapists with whom the authors were associated in the Veterans Administration Aphasic Clinic. The section on aphasia in children is based on five years of experience at the Lakewood Speech Clinic.

The *Handbook* is one that can be recommended to speech therapists, students in speech therapy, persons engaged in other areas of special education and rehabilitation, and to families of aphasic adults and children. It should prove useful in bridging the gap between theory and practice in the habilitation and rehabilitation of aphasics. The information is clearly set out and well presented, thus making it valuable as a ready reference.

Elongation Treatment of Low Back Pain. By George H. Hassard, M.D., Department of Physical Medicine and Rehabilitation, Veterans Administration and University of Oklahoma Hospitals, Oklahoma City; and Charles L. Redd, B.S., physical therapist, Owens-Illinois Company, Alton, Ill. Cloth, illus., 78 pp. Springfield, Ill.: Charles C Thomas, 1960. $4.50.

Based on concepts of treatment highly developed by Harvey E. Billig, M.D., to whom due recognition is accorded by the authors, this new manual is concerned primarily with elimination of regional pain and stiffness and the application of specific active and passive stretching procedures to loosen contracted fibrous collagen (connective) tissue. As the title indicates, some emphasis is placed on correction of lower back discomfort, though coverage necessarily includes all body segments. It is stated by the publisher that the program was "initiated and *proven* in an industry where problems of low back pains haunted the departments of medicine, safety, insurance and compensation."

In basic content the book closely parallels Billig's *Mobilization of the Human Body*, published in the United States by the Stanford University Press, 1949. However, it suffers by comparison with the latter volume (about the same size and scope) from the standpoint of organization of material, of adequacy, and clarity of presentation. This is especially true in respect to rationale underlying the therapeutic methods advocated. In what appears to be an attempt to gain understanding and acceptance by persons at different levels of educational development, the book seems, to this reviewer, to fall short of satisfying the needs and taste of both the non-professional and professional practitioner in fields of patient service utilizing physical therapeutic measures.

The small book is divided into five parts dealing with the problems for which a solution is sought: mechanical considerations, diagnosis, examination and tests, and treatment procedures. Illustrations in the form of photographs, diagrams, and outline drawings are plentiful; and an adequate bibliography is included.

Professional physical therapists may be interested in perusing this handbook for quick review of the treatment concepts it supports.

Adapted Physical Education in Schools. By Ivalclare Sprow Howland, Ed.D., Professor of Physical Education, State University of New York Teachers College at Courtland. Paper, illus., 174 pp. Dubuque, Iowa: Wm. C. Brown Co., 1959. $3.00.

This book is intended for students of physical education who have had such prerequisites as anatomy, physiology, kinesiology, physiology of exercise, health education and general teaching methods. The text is designed to be used in a junior or senior course in adapted physical education. It is constructed to offer the students of physical education a practical basis in the development of leadership competencies for the establishment of programs of adapted physical education in schools. The primary aim of the book is to provide ways and means by which the restricted child may consistently and safely take part in physical education programs as enjoyed by his fellows, and which will give him the lasting benefit of such experiences.

The textbook is divided into three parts. The first part outlines the foundations of program planning in terms of the basic philosophy of adapted physical education in schools, the scope and specific objectives of the program, and the necessity for leadership preparation. From this beginning the author proceeds to discuss principles and practices involved in the determination of the physical needs of the child. The author presents a detailed discussion on the recognition of certain orthopedic deviations and faulty body mechanics. The second part of the book contains descriptive methods used in administrating the orthopedic body mechanic screening tests. Also, this part illustrates the classification and assignment procedures that might be used in an adapted physical education program. It includes methods in which adaptations of the skills within physical education activities may be developed for the purpose of meeting the needs of each restricted child who participates in the regular physical education class. For the child who cannot participate in the regular activity program, a special class is described with suggestions that might be used to meet the needs of the child. The last chapter in this second part of the book describes therapeutic exercises designed to alleviate orthopedic deviations and faulty body mechanics. General conditioning exercises are also included. The third part presents many recreational games and modified activities that provide enjoyment and skills for restricted children who can participate only in the special class.

At the end of each chapter the author has included laboratory problems as well as references for available resource materials. Small stick figures are used to illustrate the therapeutic exercises.

In the introduction of the book the author states clearly that the approach is that of adaptation of activities to the restricted child, rather than that of correction or alleviation of existing conditions. However, in perusing the materials presented in this book, it is very difficult to believe that this was carried out. The major part of the book is directed toward the recognition of orthopedic deviations and faulty body mechanics: how to program physical education to meet this child's needs, not only through ways to adapt regular physical education activities but also through therapeutic exercises. A large section is devoted to therapeutic exercises in the special class.

It should be mentioned that this book is probably misnamed. Rather than *Adapted Physical Education in Schools*, it might have been entitled: "Adapted Physical Education for the Orthopedic Child," since, within limitations, it outlines an approach to meet the child's needs through physical activities and therapeutic exercises, and it suggests detailed examination procedures to determine the child's needs. In this limited sense, the book does present a method that might be used in some instances. At least, it may provide guideposts for setting up such a program. And it may suggest to the student possible ways for adapting activities to meet other conditions that might be encountered in a school program, such as partial sight or blindness, hard of hearing and deafness, the problem of the asthmatic child, the physically "below par" child, and others. To some extent, parts of this book contain the application of the material found in the author's book, *Body Alignment and Fundamental Skills*. The only difference is that the material has been applied to the specific problem area of adapted physical education. The book seems to be a simplification of material found in more detail in other books in this field and will not replace the more comprehensive textbooks in this area. It is primarily a laboratory book with suggestions and references for the student, the greater portion of which is devoted to posture and body mechanics, testing, and therapeutic and conditioning exercises.

A Textbook of Medicine. Tenth Edition. Edited by Russell L. Cecil, M.D., Professor of Clinical Medicine Emeritus, Cornell University; and Robert F. Loeb, M.D., Bard Professor of Medicine, Cornell University. Cloth, illus., 1665 pp. Philadelphia: W. B. Saunders and Co., 1959. $16.50.

This edition is an excellent example of the type of medical writing established by its forebear and emulated with regularity by medical writers today. It therefore has all of the advantages, annoyances, and weaknesses inherent in medical writing by contributors under editorial control. One hundred sixty-four of the world's outstanding medical authorities have drawn on their individual experience and special skills to produce a clear-cut, succinct, clinical picture of 800 separate diseases and disorders. 38 of which are completely new topics to the reader of Cecil's earlier editions.

The arrangement and method of presentation follows the earlier format and presents the subject *disease* or *disorder* in logical sequence so that its etiology, pathologic anatomy and physiology, epidemiology, diagnosis, prognosis, prophylaxis and treatment is found in logical order. The range of subjects covered is complete, running the gamut from Amebiasis to Zagari's disease (Xerostomia). The student of medicine will continue to be impressed with the compendium-like qualities of the book.

The style of writing varies widely from contributor to contributor, as is to be expected, so that the reader or student must be alert to the changing patterns of communication and expression, a natural result of today's most popular book-production method.

It is axiomatic that a textbook of such magnitude and scope requires a complete and detailed index. The completeness of the index enhances greatly the value of this book. This is one of the quickly recognizable and strongest qualities of the volume. Like its predecessors, Cecil's 10th will be found a valuable addition to any current reading or reference library.

Massage, Manipulation, and Traction. Vol. 5. Edited by Sidney Licht, M.D., Assistant Clinical Professor of Physical Medicine, Yale University School of Medicine. Cloth, illus., 275 pp. New Haven, Conn.: Elizabeth Licht, 1960. $10.00.

This fifth volume of the *Physical Medicine Library*, edited by Sidney Licht, presents subject matter and treatment procedures some of which date from ancient times and others that are relatively new in Europe and only recently introduced to the United States. The book consists of a section for each topic: Massage, Manipulation, and Traction, with a total of thirteen chapters. Physical therapists Ginette Elminger, (Switzerland), and Irmgard Seeberger Bischoff, (Germany), editor of the Dicke book on Bindegewebsmassage, are jointly responsible for the chapter "Connective Tissue Massage." The remaining twelve chapters are by physicians, mainly from Europe, who have either introduced the treatment methods discussed, or who are considered foremost authorities in their specialties. The two sections covering manipulation and traction are presented exclusively by specialists in physical medicine for the purpose of indicating to physiatrists their ideas and experiences in these areas. It may be important, perhaps, to mention here that the section on traction refers to spinal traction of the nonsurgical type. Its use for the most part is concerned with minor displacements or pathology rather than with fractures and dislocations of the spine.

The purpose of the book is not to make a masseur or manipulator of the reader but rather to give the physicians an opportunity to learn the rationale and methods of mechanical therapeutic procedures advocated in physical medicine. Many of the methods are as old as medicine itself and many of the clinical results cannot be scientifically explained. Yet desirable and effective results seem to be apparent as a result of their use. All three modes of treatment, especially massage, have endured a stormy course throughout history with intermittent periods of acclaim to total rejection. The fact that they are still widely used and sought after by the laity and remain to a great extent in the hands of unqualified practitioners indicates a need for action. The medical profession ought to be more concerned and should investigate in order to see what is worth continuing and using, and thereby protect the public from possible harm and undue claims.

The contributors present their topics for the most part objectively, honestly admitting that they do not know all the answers, and with an awareness that terminology and methods differ among the various specialists. They have deliberately given major emphasis to *methods* rather than to *results*. The physician reader may accept or reject, as he sees fit, but it is hoped he will be able to prescribe and evaluate critically with greater insight the means of treatment discussed.

This volume should serve as an excellent reference for physicians, instructors, graduate and student physical therapists. All chapters are pertinent to the work of the physical therapist except for the two on manipulation of the spine and joints.

The section on MASSAGE includes the history, physiological effects, clinical applications, the usual fundamental manual movements, and the use of various "machines" and mechanical devices. The history is especially well done in a concise, informative and interesting manner. A total of 174 references are listed, dating from the sixteenth century to the present. Dr. Kamenetz states that the two latest contributions to massage are ultrasound, which he considers a form of micromassage, and syncardial treatment (pressure to the extremities by electrical stimulation). Those seeking information about the latter and also on *Bindegewebsmassage* will find both very well explained and illustrated. Numerous references are listed for those desiring more detailed information.

The chapters on spinal traction discuss methods using manual force and those controlled by electrical equipment, for continuous and intermittent traction. Traction, here, is considered "a manipulation with apparatus." As previously stated, discogenic lesions of the spine are discussed, rather than fractures and dislocations of the spine. Head halters, tilt tables for neck traction, the simple horizontal table, the split table, and the Scott traction table are among the types presented as well as mechanized equipment. The reviewer believes this to be the most complete coverage in one book for this type traction.

As in previous volumes, each chapter is followed by a number of references, some of which are extensive. Grouping and including in one book these three highly controversial subjects is perhaps a very good idea. All have much in common and share similar problems, the greatest perhaps being the lack of adequate investigation and scientific explanation for a number of apparently helpful methods of treatment. Should there someday be a reorganization of material thus far presented in the five volumes, perhaps the syncardial therapy could well be included with other electrotherapeutic procedures.

The reviewer believes that Dr. Licht has succeeded in adding another most worthwhile volume to the *Physical Medicine Library*. As a reference book it will be very useful to those already in physical therapy and physical medicine, to the students, and to those in other medical specialties interested in physical medicine.

Book Reviewers for August

Elizabeth C. Addoms, Associate Professor of Education, Physical Therapy Program, New York University, Brooklyn, N.Y.

Elsie M. Edwards, Ed.D., Assistant Professor of Speech and Teacher Education, Michigan State University, East Lansing.

Mary E. Callahan, Director, Training Course for Physical Therapists, College of Physicians and Surgeons, Columbia University, New York.

John H. Kuitert, Lt. Col., MC, U.S. Army Standardization Representative, Post Surgeon, Ft. Lewis, Washington.

Frederick E. Vultee, M.D., Associate Director, Rehabilitation Institute of Chicago, Chicago.

Janet Wessel, Ph.D., Professor, Department of Physical Education, Michigan State University, East Lansing.

Lucien Zadrozny, Review Specialist, Disability Determination Unit, State Bureau of Vocational Rehabilitation, Hartford, Conn.

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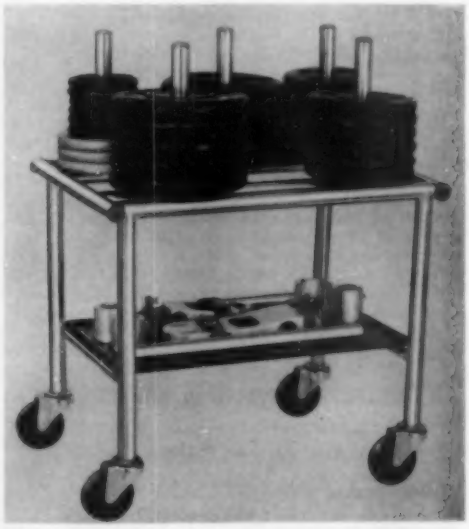

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Burdick

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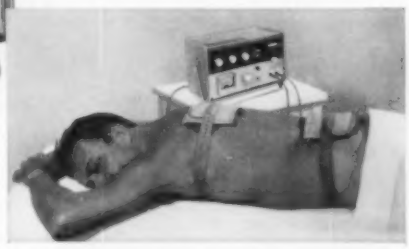

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For added convenience the control panel of the MS-600 is color-coded. The upper section is dark and houses the Faradic and Tetanizing controls, the light lower portion the Galvanic current. For complete information on the MS-600, see your local Burdick representative or write us directly.

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